

This report cancels and replaces the test report N° RRA-EMIESS21G095EWA-05A v1"



Test report issued under the responsibility of:
EMITECH ILE DE FRANCE Laboratory
MRA US-EU Designation Number: FR0004
IC Assigned Code: 4379A

RADIO TEST REPORT

FCC 47 CFR PART 15 : 2021 (§15.247)

RSS-247_Issue 2 : 2017

RSS-Gen_Issue 5 : 2019

Company : **EWATTCH**
Address..... : 13 Rue Maurice Jeandon
88100 SAINT DIE DES VOSGES - FRANCE

Test item description. : **TYNESS-FACTORY**
Trade Mark. : Not communicated
Manufacturer..... : **EWATTCH**
Model/Type reference..... : **TYNESS_V3**
Ratings..... : 24Vdc ±5%

Testing Laboratory : **EMITECH ILE DE FRANCE Laboratory**
Address..... : 30-32, avenue des 3 Peuples
78180 MONTIGNY-LE-BRETONNEUX - FRANCE

Report Reference No. : **RRA-EMIESS21G095EWA-5A v2**
Test procedure. : FCC and CANADA marking
Diffusion..... : Mr. MICHELIN
Applicant's name. : EWATTCH
Date of issue..... : 07/11/2023
Total number of pages..... : 76
Revision. : 2
Compiled by..... : C.A. ROBERT (Test technician)

Technical verification..... :
PELLERIN Bruno
Assistant to the EMC and Radio Laboratory Manager

Quality approval..... :
MICHAU Maxime
EMC / Radio Laboratory Manager
Signature
numérique de
Maxime MICHAU
Date : 2023.11.08
09:36:28 +01'00'

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REVISION HISTORY:

Revision	Date	Modified pages	Modifications
0	26/09/2023	/	Creation
1	12/10/2023	5	Add of FCC and IC ID
		13	Add of number of channel
2	07/11/2023	4	Retry of ANSI C63.4 standard
		18 ; 21 ; 22	Table modification

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment (denominated hereafter E.U.T.: equipment under test) according to documents listed in §2 of this test report.

TESTING PROCEDURE AND TESTING LOCATION:			
Testing Laboratory	EMITECH ILE DE FRANCE Laboratory		
Address.	30-32, avenue des 3 Peuples 78180 MONTIGNY-LE-BRETONNEUX FRANCE		
Test procedure.	CE Marking		
Tested by	C.A. ROBERT / F. LHEUREUX		
Test supervisor	B. PELLERIN		
Date of receipt of test item	25/01/2023		
Dates of performance of tests	From 01/02/2023 to 10/02/2023		
APPLICANT'S GENERAL INFORMATIONS:			
Company name	EWATTCH		
Company address.	13 Rue Maurice Jeandon 88100 SAINT DIE DES VOSGES FRANCE		
Person present during the tests.	-		
Responsible.	Mr. MICHELIN		
GENERAL REMARKS:			
<i>The information in italics is declared by the manufacturer and is under his responsibility.</i> The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report the decimal separator is point.			
POSSIBLE TEST CASE VERDICTS:			
Test case does not apply to the test object.:	N/A		
Test case not performed.....	N/P		
Test object does meet the requirement.....	P (Pass)		
Test object does not meet the requirement.	F (Fail)		
Test object was not subjected to all tests...	I (Inconclusive)		
DEFINITIONS AND ABBREVIATIONS:			
E.U.T.	Equipement under test	AE	Auxiliary / Associated equipment
RBW	Resolution bandwidth	VBW	Video bandwidth
OATS	Open area test site	FAR	Full anechoic room
RF	Radio frequency	NTR	Nothing to report

2. REFERENCE DOCUMENTS

NORMATIVE REFERENCES:

The following referenced documents are necessary for the application of the present test report.

FCC 47 CFR Part 15 : 2021

Code of federal regulations

Title 47- Telecommunication Chapter 1- Federal Communication Commission

Part 15- Radio frequency devices Subpart B- Unintentional Radiators

Limits and methods of measurement of radio disturbance

Characteristic of information technology equipment.

RSS-247 Issue 2 : 2017

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs)

And Licence-Exempt Local Area Network (LE-LAN) Devices.

RSS-Gen Issue 5 : March 2019

General Requirements and Information for the Certification of Radio Apparatus

KDB 558074 D01 DTS Meas Guidance V05 r02

Guidance for performing compliance measurement on Digital Transmission Systems (DTS) operating under § 15.247.

ANSI C63.10 : 2013

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

INFORMATIVE REFERENCES:

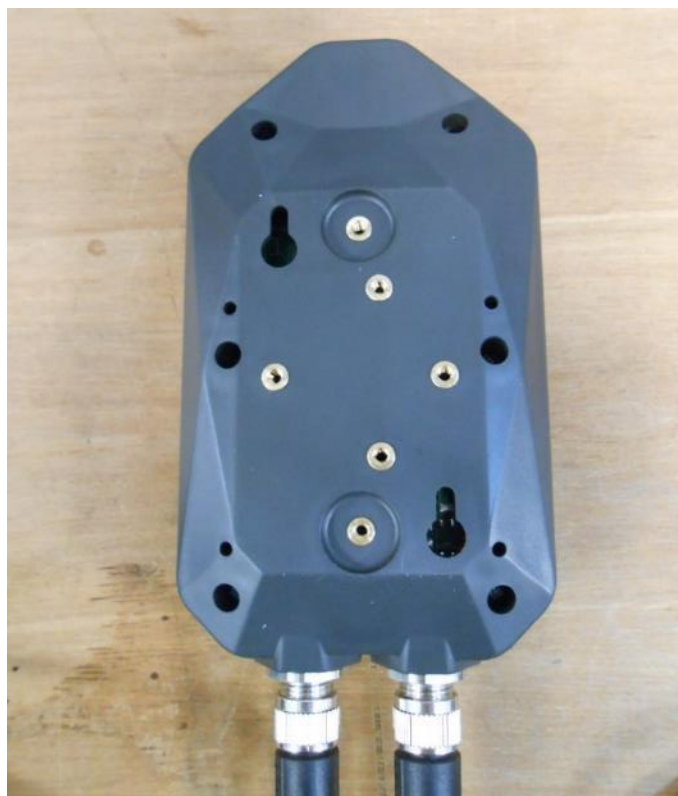
/

3.1. Test Conditions

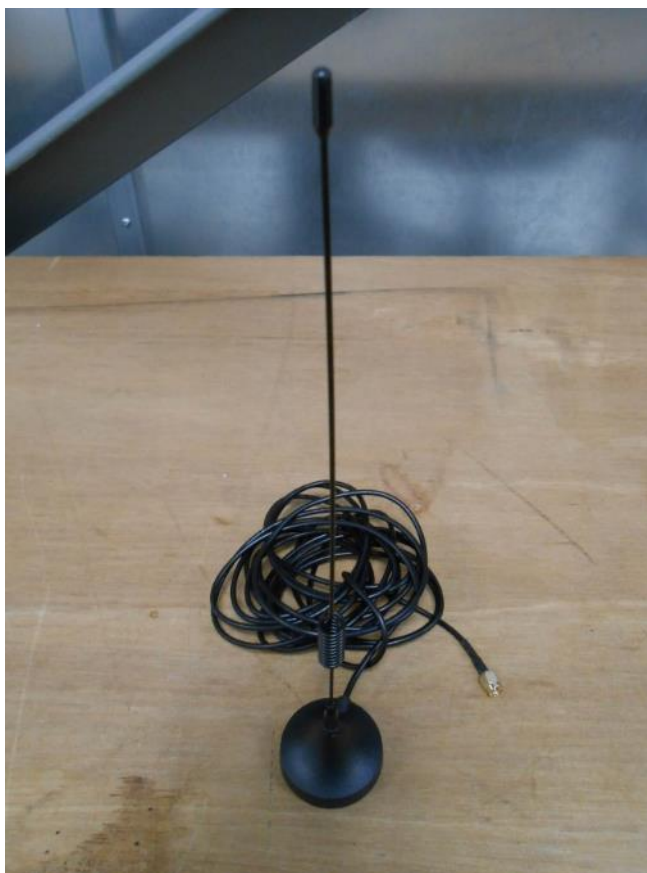
Test item description.	: TYNESS-FACTORY
Model/Type reference.....	: TYNESS_V3
Trade Mark.	: Not communicated
Serial number (S/N).....	: 70B3D54750130F2E
Part number (P/N).	: Not communicated
Software version.....	: Not communicated
Firmware version.	: 3.30
Fcc ID	: 2BBDC-TYNESS-V3-01
N°IC	: 31217-TYNESSV301
HVIN/MODEL.....	: TYNESS FACTORY
Type of sample.	: serial
Function(s).....	: TYNESS-FACTORY measures the current of equipment with three current clamps, and measure two 0-24V signals, two temperatures (PT100) and has two 24V pulse counters. The data is transmitted over a LoRaWan network.
Manufacturer name.	: EWATTCH
Address.	: 13 Rue Maurice Jeandon 88100 ST DIE DES VOSGES FRANCE

General product information: -

3.2.E.U.T Overview



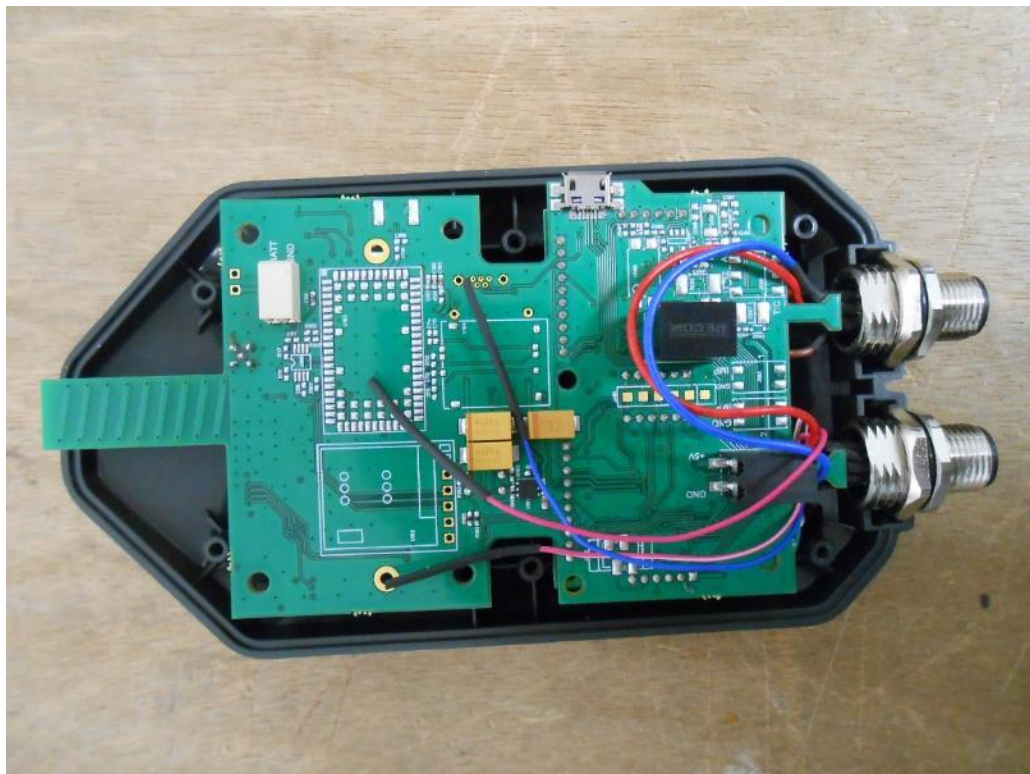
3.2.E.U.T Overview



3.3.E.U.T Marking Plate



3.4.E.U.T Electronic board

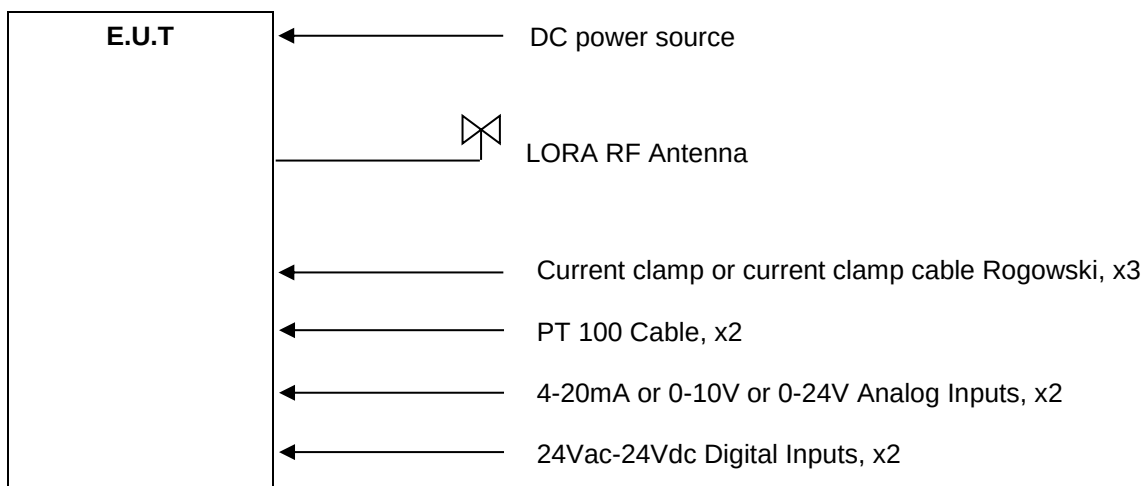


3.5.E.U.T Mechanical and Electrical Design

Power supply..... : 24 Vdc
 Power supply range..... : 24 Vdc $\pm 5\%$
 Power type..... : 24 Vdc Power Supply
 Power (W)..... : 1.2
 Nominal current (A). : 0.05
 Dimensions (L x W x H) (mm). : 142 x 77 x 36
 Weight (kg). : 0.15
 Temperature range (°C). : +5 to +65
 Ground bounding strap..... : No

Comments: -

3.6.E.U.T Input/Output ports



PORT	NAME	TYPE	LENGHT	CABLE TYPE	COMMENTS
1	DC power source	DC	< 3m	Not shielded	2 Wires
2	External Lora Antenna	RF	< 3m	Shielded	-
3	Current clamp or current clamp cable Rogowski, x3	I/O	< 3m	Not shielded	-
4	PT 100 Cable, x2	I/O	< 3m	Shielded	-
5	4-20mA or 0-10V or 0-24V Analog Inputs, x2	I/O	< 3m	Not shielded	-
6	24Vac-24Vdc Digital Inputs, x2	I/O	< 3m	Not shielded	-

AC/DC : AC/DC Converter port
 I/O: Input or Output port
 N/E: Non Electrical port

AC: Alternative current port
 TP : Telecommunication port

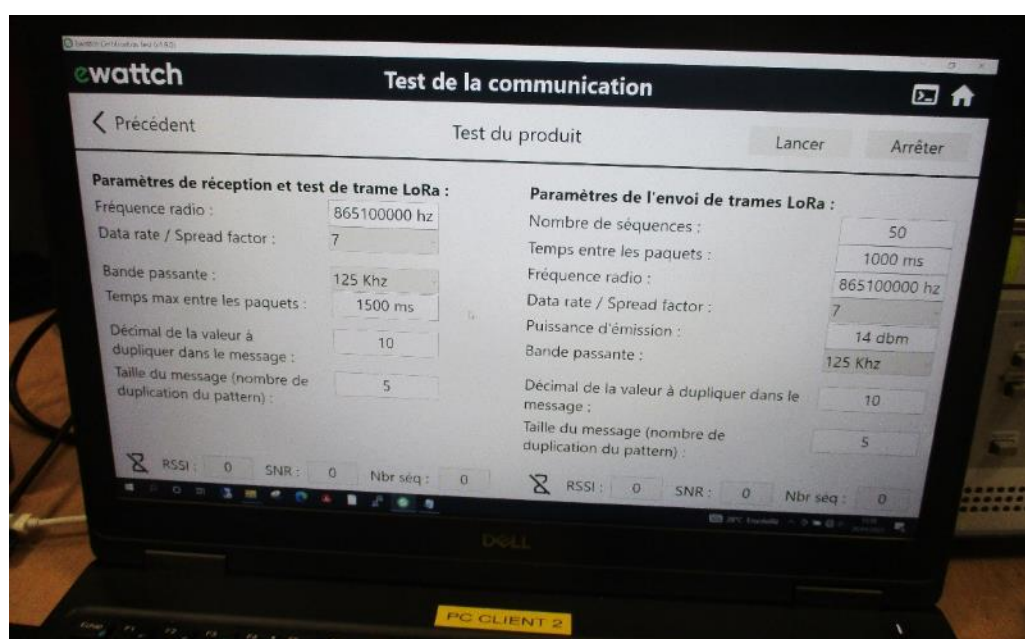
DC: Direct current port
 RF : Radio frequency port

3.7. Supporting Equipment Used During Test

Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
-	-	-	-

3.8. Auxiliary equipment



3.8. Auxiliary equipment



Power supply for conducted emission

3.9. E.U.T Radio Specifications

a) GENERAL INFORMATIONS	
According to manufacturer's declarations :	
EUT type.....	Transceiver
Technology	LoRa
Environmental profile.....	Residential, Light Industry
Temperature range.....	Low extreme conditions: +5 °C High extreme conditions: +65 °C
Antenna type	External
Antenna Gain.....	+3 dBi
Comments: -	
b) TRANSMITTER PARAMITERS (Tx)	
Frequency bands.....	902.3 MHz - 914.9 MHz (Spread factor : 10 / 125 kHz) 903.0 MHz - 914.2 MHz (Spread factor : 8 / 500 kHz)
RF Power.....	+14 dBm
Number of channels / Separation.....	125kHz OCW : 64 500kHz OCW : 8
Modulation type	LoRa
Duty cycle	maximum transmission time : 400 ms for FHS mode
Tested frequency.....	For spread factor = 10 and bandwidth = 125 kHz (FHS mode) Lowest channel : 902.3 MHz Middle channel : 908.7 MHz Highest channel : 914.9 MHz For spread factor = 8 and bandwidth = 500 kHz (DTS mode) Lowest channel : 903.0 MHz Middle channel : 909.4 MHz Highest channel : 914.2 MHz
c) RECEIVER PARAMETERS (Rx)	
Frequency bands.....	902.3 MHz - 914.9 MHz (Spread factor : 10 / 125 kHz) 903.0 MHz - 914.2 MHz (Spread factor : 8 / 500 kHz) 923.3 MHz - 927.5 MHz (Spread factor : 12)
Category/Class	2
Bandwidth	Not communicated

4. RESULT SUMMARY

Subpart C of the standard FCC part 15 – Intentional radiators

TEST DESIGNATION	TEST PROCEDURE	VERDICT	COMMENTS
Restriction bands of operation	15.205	PASS	
Measurement of conducted emission on AC mains ports	15.207		
- Power supply 120 Vac / 60 Hz	-	-	
- Power supply 120 Vac / 60 Hz (Average value)	-	PASS	
Radiated emission limits; general requirements	15.209	PASS	
Additional provision to the general radiated emission limitations	15.215		
-(a) Alternative to general radiated emission limits		N/A	
-(b) Unwanted emissions outside of § 15.247 frequency bands	-	N/A	
-(c) 20 dB bandwidth and band-edge compliance		PASS	
Intentional radiated emissions	15.247		
- a) frequency hopping and digitally modulated	-	PASS	
- a) (1) hopping mode	-	N/A	
- a) (1) (i) frequency hopping in the band 902-928 MHz	-	PASS	
- a) (1) (ii) frequency hopping in the band 5725-5850 MHz	-	N/A	
- a) (1) (iii) frequency hopping in the band 2400-2483.5 MHz	-	N/A	
- a) (2) systems using digital modulation in the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz (6 dB bandwidth)	-	PASS	
- b) maximum peak conducted	-	-	
- b) (1) frequency hopping in the bands 2400-2483.5 MHz or 5725-5850 MHz	-	N/A	
- b) (2) frequency hopping in the band 902-928 MHz	-	PASS	
- b) (3) systems using digital modulation in the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz	-	PASS	
- b) (4) maximum peak conducted > 6 dBi	-	N/A	
- b) (4) (i) frequency hopping in the band 2400-2483.5 MHz	-	N/A	
- b) (4) (ii) frequency hopping in the band 5725-5850 MHz	-	N/A	
- b) (4) (iii) fixed, point-to-point	-	N/A	
- c) directional antenna > 6 dBi	-	N/A	
- c) (1) fixed, point-to-point operation	-	N/A	
- c) (1) (i) in the band 2400-2483.5 MHz	-	N/A	
- c) (1) (ii) in the band 5725-5850 MHz	-	N/A	
- c) (1) (iii) fixed, point-to-point	-	N/A	
- c) (2) multiple directional beams in the band 2400-2483.5 MHz	-	N/A	
- c) (2) (i) information	-	N/A	
- c) (2) (ii) sum of the power supplied to all antennas	-	N/A	
- c) (2) (iii) one antenna for multiple directional beams	-	N/A	
- c) (2) (iv) single directional beam	-	N/A	
- d) intentional radiator	-	PASS	
- e) peak power spectral density	-	PASS	
- f) hybrid system	-	N/A	
- g) continuous data stream during the test	-	N/A	

TEST DESIGNATION	TEST PROCEDURE	VERDICT	COMMENTS
- h) to avoid hopping on occupied channels	-	N/A	
- i) RF exposure compliance	-	N/A	

Standard RSS-247 Issue 2 : 2017

TEST DESIGNATION	TEST PROCEDURE	VERDICT	COMMENTS
3. Certification Requirements			
- 3.1 RSS-gen compliance	-	N/A	
5.1 Frequency hopping systems (FHS)			
- 5.1.a)	-	PASS	
- 5.1.b)	-	PASS	
- 5.1.c)	-	PASS	
- 5.1.d)	-	N/A	
- 5.1.e)	-	N/A	
5.2 Digital Modulation Systems			
- (1) -6 dB bandwidth	-	PASS	
- (2) transmitter power spectral density	-	PASS	
5.4 Transmitter Output Power and e.i.r.p. Requirement			
- 1) 902-928 MHz frequency hopping systems output power / e.i.r.p.	-	PASS	
- 2) 2400-2483.5 MHz frequency hopping systems output power / e.i.r.p	-	N/A	
- 3) 5725-5850 MHz frequency hopping systems output power / e.i.r.p.	-	N/A	
- 4) Digital modulation systems output power / e.i.r.p.	-	PASS	
- 5) point-to-point systems (2400-2483.5 and 5725-5850 MHz)	-	N/A	
- 6) Multiple directional beams antenna systems (2400-2483.5 MHz)	-	N/A	
5.5 Unwanted emission	-	PASS	

Standard RSS-Gen Issue 5 : 2019

TEST DESIGNATION	TEST PROCEDURE	VERDICT	COMMENTS
6 Technical Requirements			
- 6.6 Occupied Bandwidth	-	PASS	
- 6.9 CISPR Quasi-peak detector	-	PASS	
- 6.12 Transmitter Output Power	-	PASS	
- 6.13 Transmitter unwanted emissions	-	PASS	
7.2 Measurement Methods and Standard Specifications			
- 7.2.1 Measurement Bandwidths and Detector Functions	-	N/A	
- 7.2.2 Emissions Falling Within Restricted Frequency Bands	-	N/A	
- 7.2.3 Devices Employing Pulsed Operation	-	N/A	
- 7.2.4 AC Power Line Conducted Emissions Limits	-	PASS	
- 7.2.5 Transmitter Spurious Emission Limits	-	N/A	
- 7.2.6 Transmitter Frequency Stability	-	N/A	
- 7.2.7 Measurement Distance	-	N/A	
8. Licence-Exempt radio Apparatus			
- 8.8 AC Power Line Conducted Emission Limits for licence-Exempt Radio Apparatus	-	PASS	

Sample subject to the test complies with the requirements of the reference document listed in §2 of this test report and, where applicable, with deviations specified in this document.

To declare, or not, the compliance with the specifications, it was not explicitly taken account of uncertainty associated with the results.

Modifications : No

5. MEASUREMENT UNCERTAINTY

PARAMETER	MAXIMAL EMITECH UNCERTAINTY	MINIMAL STANDARD UNCERTAINTY
Radio frequency	$\pm 1 \times 10^{-7}$	$\pm 1 \times 10^{-7}$
RF power, conducted		
RF power	$\pm 0.8\text{dB}$	$\pm 1 \text{ dB}$
RF power (EN 300328 / EN 301893)	$\pm 1.3\text{dB}$	$\pm 1.5 \text{ dB}$
Power spectral density	$\pm 2.3\text{dB}$	$\pm 3 \text{ dB}$
Occupied bandwidth		
RF power	$\pm 3.8 \%$	$\pm 5 \%$
RF power (EN 300328 / EN 301893)	$\pm 3.8 \%$	$\pm 5 \%$
Maximum frequency deviation		
300 Hz < audio frequency < 6 kHz	$\pm 1.2 \%$	$\pm 5 \%$
6 kHz < audio frequency < 25 kHz	$\pm 1.2 \%$	$\pm 3 \text{ dB}$
Adjacent channel power	$\pm 1.6 \text{ dB}$	$\pm 3 \text{ dB}$
Sensibility of receiver (conducted)	$\pm 2.0 \text{ dB}$	$\pm 3 \text{ dB}$
Blocking	$\pm 4.0 \text{ dB}$	$\pm 4 \text{ dB}$
Transitoire		
Amplitude	$\pm 8.5 \%$	$\pm 20 \%$
At the frequency	$\pm 166 \text{ Hz}$	$\pm 250 \text{ Hz}$
Conducted emission (spurious)		
$f \leq 1 \text{ GHz}$	$\pm 0.8 \text{ dB}$	$\pm 3 \text{ dB}$
1 GHz - 12.75 GHz	$\pm 1.6 \text{ dB}$	
Radiated emission (PAR / PIRE / RNE)		
$f \leq 62.5 \text{ MHz}$	$\pm 5.1 \text{ dB}$	$\pm 6 \text{ dB}$
62.5 MHz - 1 GHz	$\pm 5.1 \text{ dB}$	$\pm 6 \text{ dB}$
1 GHz - 18 GHz	$\pm 5.2 \text{ dB}$	$\pm 6 \text{ dB}$
18 GHz – 26 GHz	$\pm 5.1 \text{ dB}$	$\pm 6 \text{ dB}$
26 GHz – 40 GHz	$\pm 5.4 \text{ dB}$	$\pm 6 \text{ dB}$
RF power (EN 300328 / EN 301893)	$\pm 5.3 \text{ dB}$	$\pm 6 \text{ dB}$
PIRE and power spectral density with diode	$\pm 5.4 \text{ dB}$	$\pm 6 \text{ dB}$
Radiated emission (magnetic field)		
9kHz – 30MHz	$\pm 3 \text{ dB}$	$\pm 6 \text{ dB}$
RF level for a given BER	$\pm 0.8 \text{ dB}$	$\pm 1.5 \text{ dB}$
Supply voltages	$\pm 3 \%$	$\pm 3 \%$
Temperature	$\pm 1 \text{ }^{\circ}\text{C}$	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5 \%$	$\pm 5 \%$
Time / Duty cycle	$\pm 4.4 \%$	$\pm 5 \%$
Adaptivity	$\pm 2.9 \text{ dB}$	/
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	$\pm 2.7 \text{ dB}$	/
30MHz – 1GHz	$\pm 5.0 \text{ dB}$	/
1GHz – 18GHz	$\pm 5.6 \text{ dB}$	/
18GHz – 26GHz	$\pm 5.7 \text{ dB}$	/
26GHz – 40GHz	$\pm 5.7 \text{ dB}$	/

For the calcul of expanded uncertainty, the confidence interval is 95 % (k=2).

6. TEST CONDITIONS AND RESULTS

6.1.Measurement of conducted emission on AC mains ports

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-Gen Issue 5 : 2019
Test method:	§ 15.207 of FCC 47 CFR PART 15 : 2021 § 7.2.4 and § 8.8 of RSS-Gen Issue 5 : 2019
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. All power was connected to the system through Artificial Mains Network (AMN). The AMN is placed at 40 cm from the boundary of the E.U.T. and bonded to a ground reference plane. All tested telecommunications lines (if applicable) were connected to an Asymmetric Artificial Network (AAN) and conducted voltage measurements on telecommunications lines were made at the output of the AAN. Where an AAN was not appropriate or available, measurements were made using a Capacitive Voltage Probe and/or a Current probe.	

TESTED CABLE	PARAMETER	SEVERITY	VERDICT
Power supply 120 Vac / 60 Hz – Radio ON	150kHz-30MHz	Class B	-
Power supply 120 Vac / 60 Hz (Average value) - Radio ON	150kHz-30MHz	Class B	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	22 °C
Relative Humidity	30 to 60 %	45 %
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No.		
Supplementary information: -		

TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
02813	Cable	/	N-2m	20/04/2022	20/06/2024
06602	LISN	Rohde & Schwarz	ESH3-Z5	26/01/2022	26/03/2024
18365	Multimeter	Emitech	Absorbeur courant de gaine	26/01/2022	26/03/2024
04637	Power supply	Schaffner	NSG 1007-5-400	06/10/2022	06/12/2023
00825	Receiver	Rohde & Schwarz	ESH3 (V 335.8017.52)	03/03/2022	03/05/2024
02205	Spectrum analyzer	Agilent Technologies	E7405A (V A.14.06)	03/06/2022	03/08/2024
00000	Software	Nexio	BAT EMC		
00237	Surges Suppressor	Hewlett Packard	11947A	17/08/2020	17/10/2023
14875	Test enclosure	Emitech	HC1		

BAT-EMC software version: V3.18.0.26

Blank cells = Permanent validity

TEST SETUP PHOTOS - POWER SUPPLY 120 VAC / 60 HZ



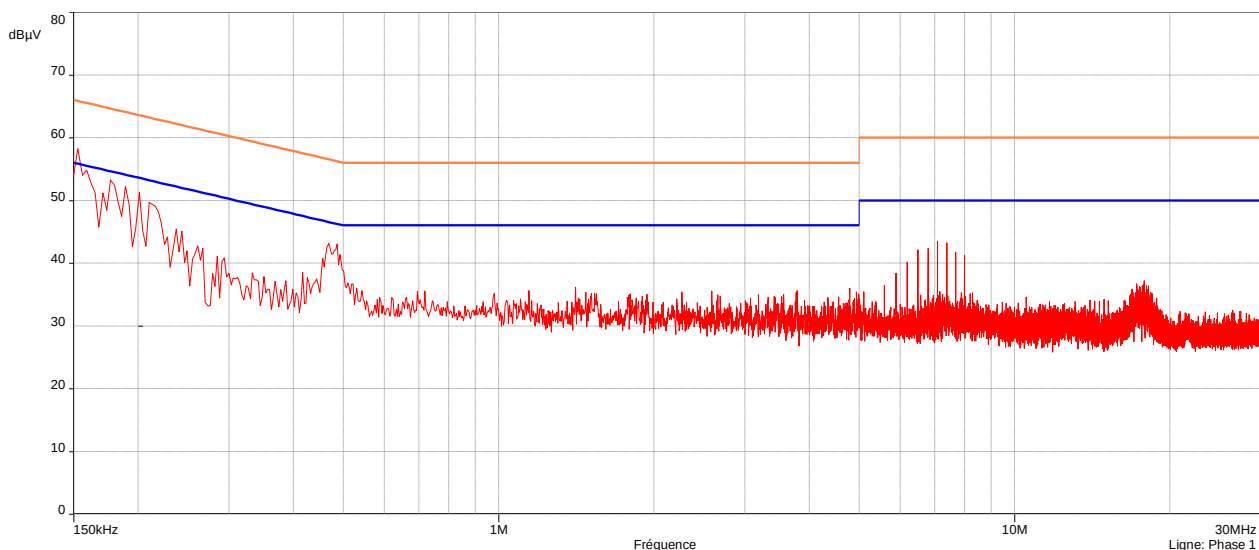
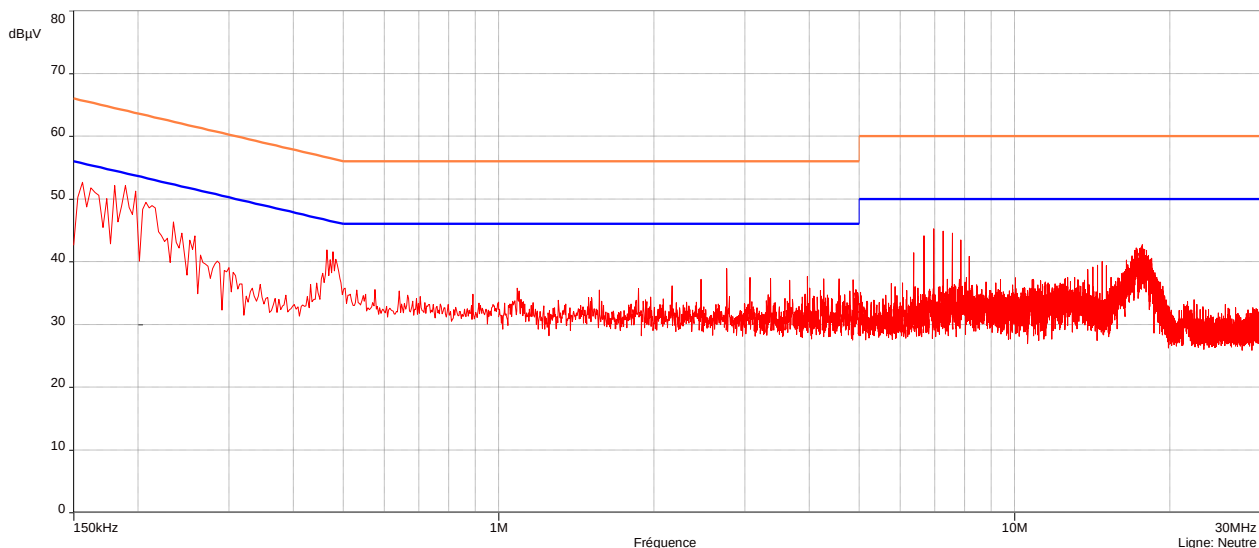
TEST SETUP PHOTOS - POWER SUPPLY 120 VAC / 60 Hz



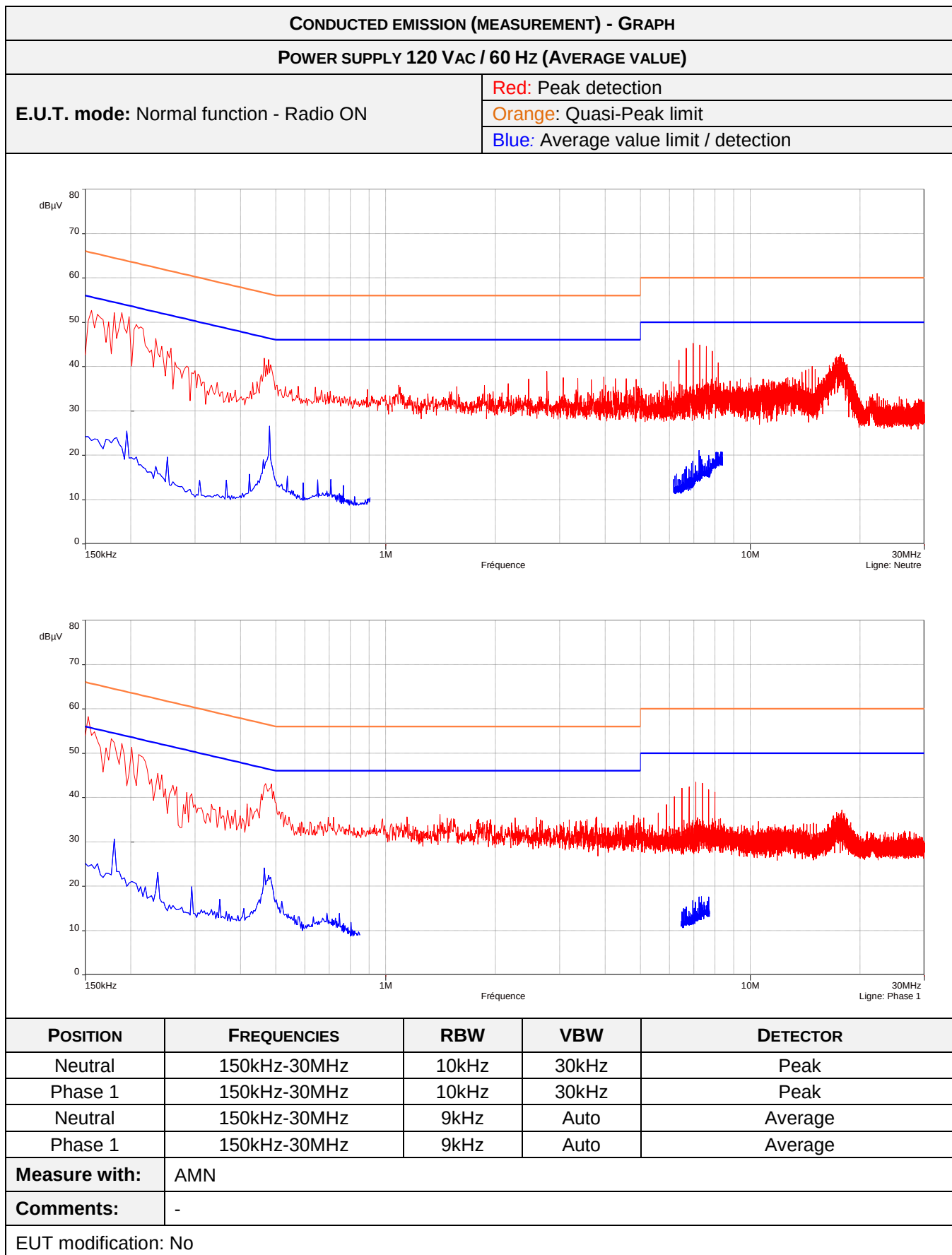
CONDUCTED EMISSION (MEASUREMENT) - GRAPH
POWER SUPPLY 120 VAC / 60 Hz
E.U.T. mode: Normal function - Radio ON

Red: Peak detection

Orange: Quasi-Peak limit

Blue: Average value limit


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Neutral	150kHz-1MHz	10kHz	30kHz	Peak
Neutral	1MHz-30MHz	10kHz	30kHz	Peak
Phase 1	150kHz-1MHz	10kHz	30kHz	Peak
Phase 1	1MHz-30MHz	10kHz	30kHz	Peak
Measure with:	AMN.			
Comments:	-			
EUT modification: No				



6.2. Frequency hopping and Digital modulation systems

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.247 a) (2) and a) (1) (i) of FCC 47 CFR PART 15 : 2021 § 5.2 a) of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

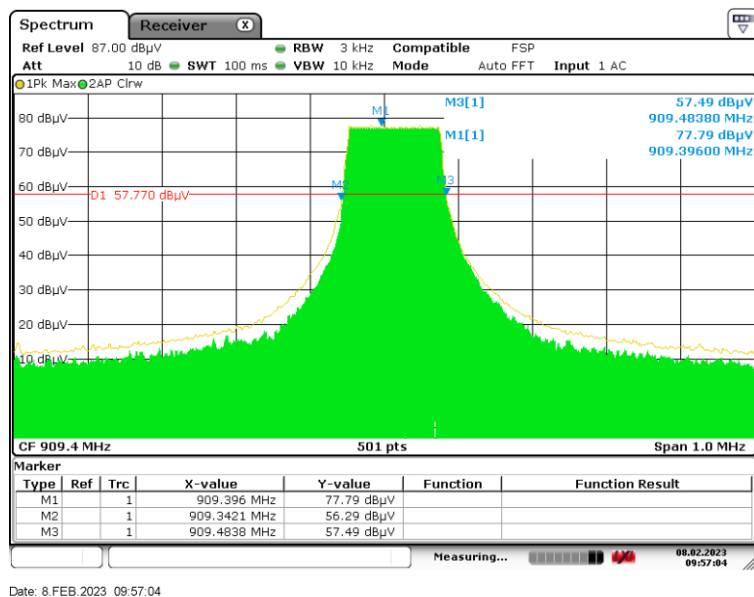
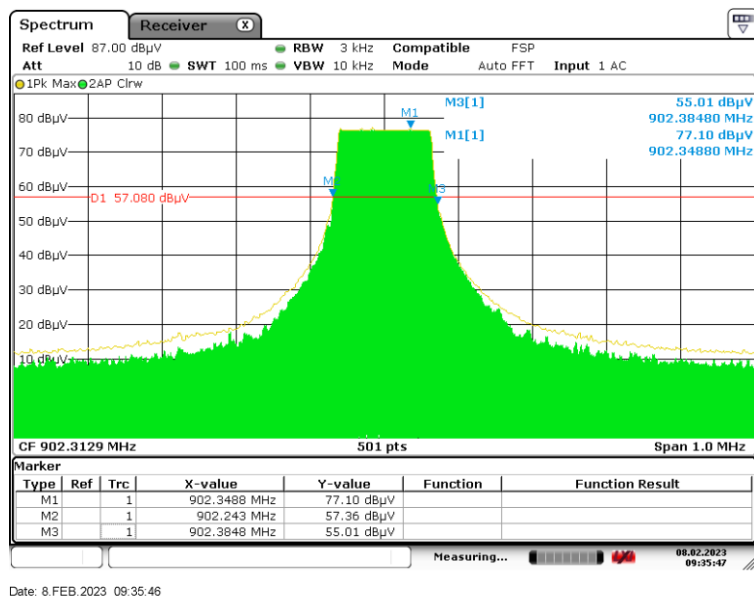
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

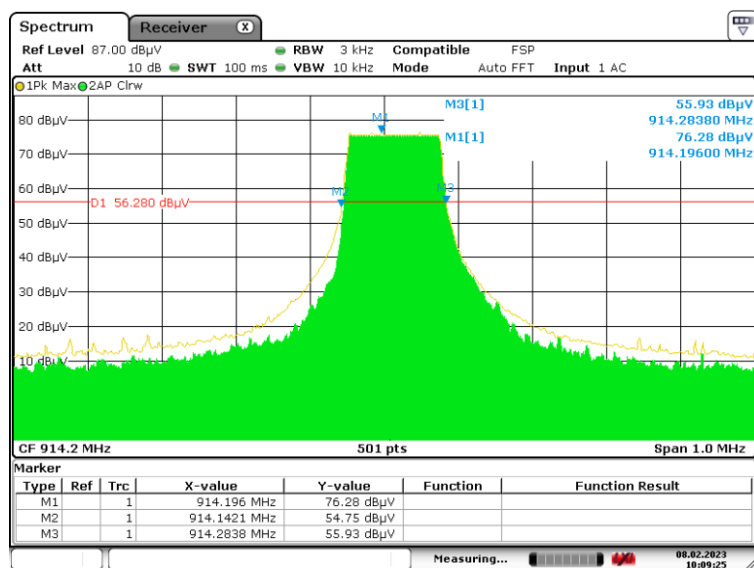
TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
3106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
8061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

Blank cells = Permanent validity

20 dB Bandwidth

E.U.T. mode	Frequency	Results (kHz)	Limit (kHz)
SF 10 ; bandwidth 125 kHz (FHS mode)	902.3 MHz	142.0	500
	908.7 MHz	142.0	500
	914.9 MHz	142.0	500

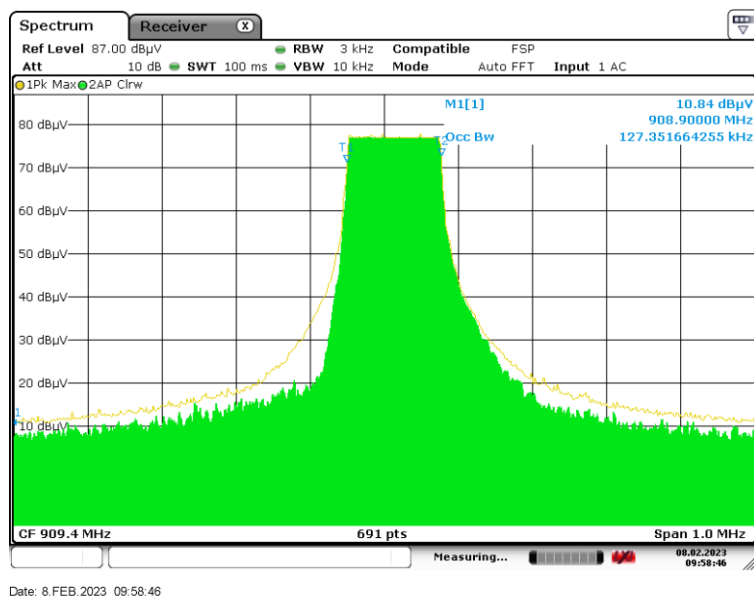
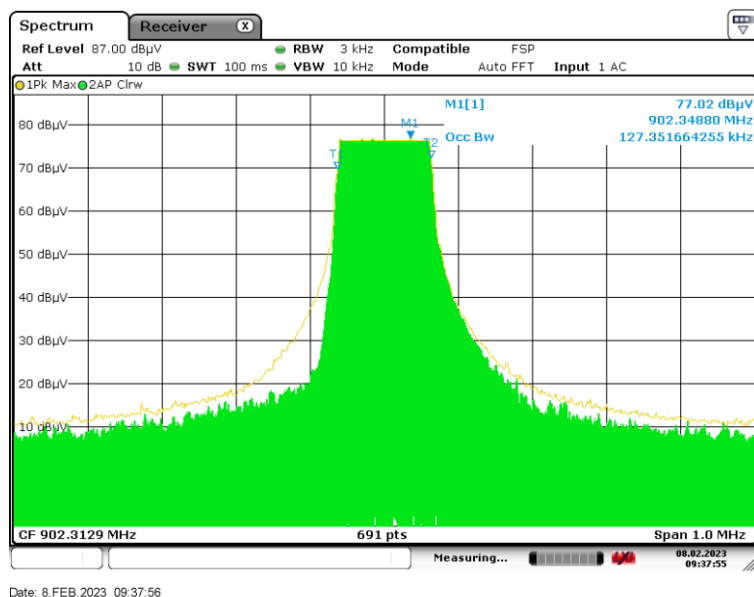


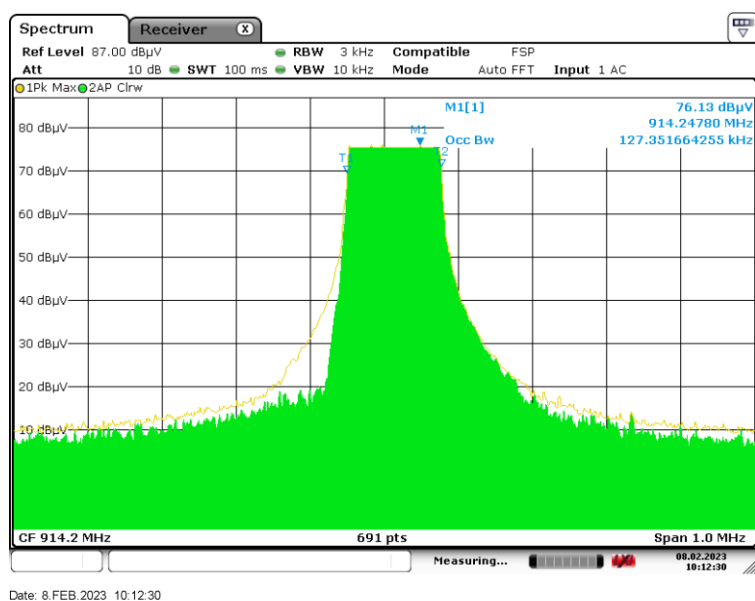


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99% Bandwidth

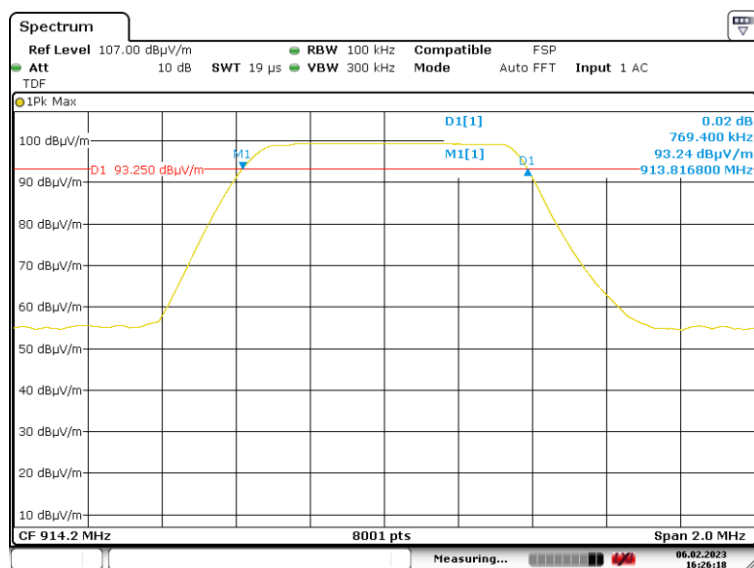
E.U.T. mode	Frequency	Results (kHz)	Limit (kHz)
SF 10 ; bandwidth 125 kHz (FHS mode)	902.3 MHz	127.3	500
	908.7 MHz	127.3	500
	914.9 MHz	127.3	500





E.U.T. mode	Frequency	Results (kHz)	Limit (kHz)
SF 8 ; bandwidth 500 kHz (DTS mode)	903.0 MHz	753.41	≥ 500
	909.4 MHz	762.90	≥ 500
	914.2 MHz	769.40	≥ 500

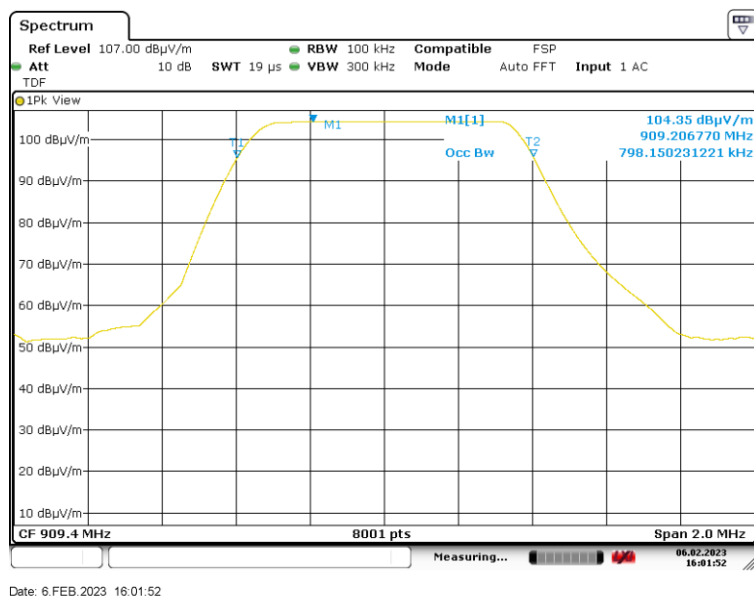
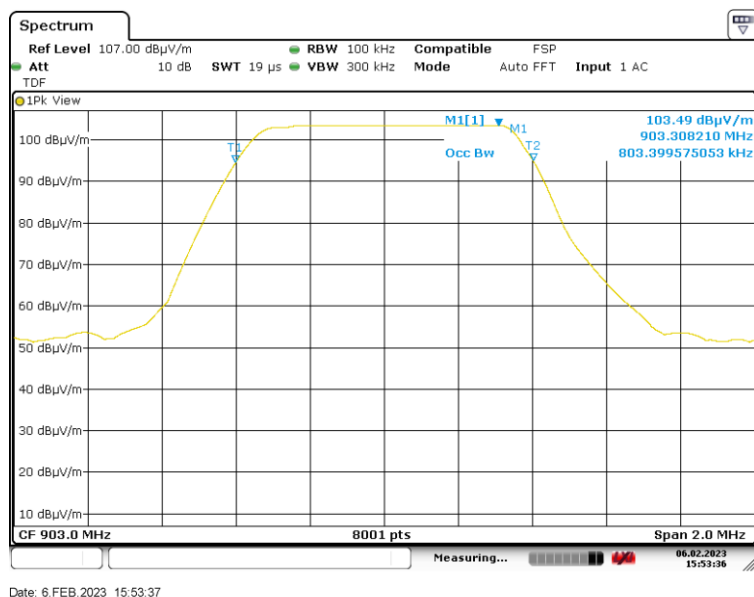


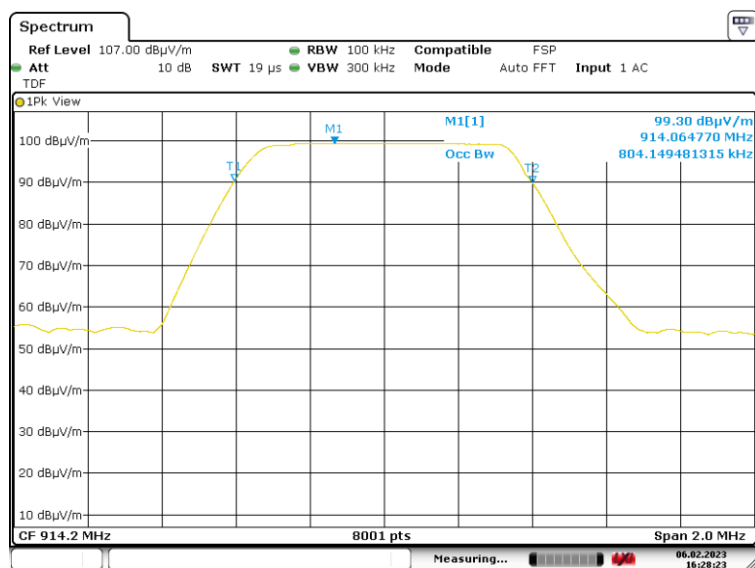


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99% Bandwidth

E.U.T. mode	Frequency	Results (kHz)	Limit (kHz)
SF 8 ; bandwidth 500 kHz (DTS mode)	903.0 MHz	803.40	≥ 500
	909.4 MHz	798.15	≥ 500
	914.2 MHz	804.15	≥ 500





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6.3. Carrier Frequency Separation

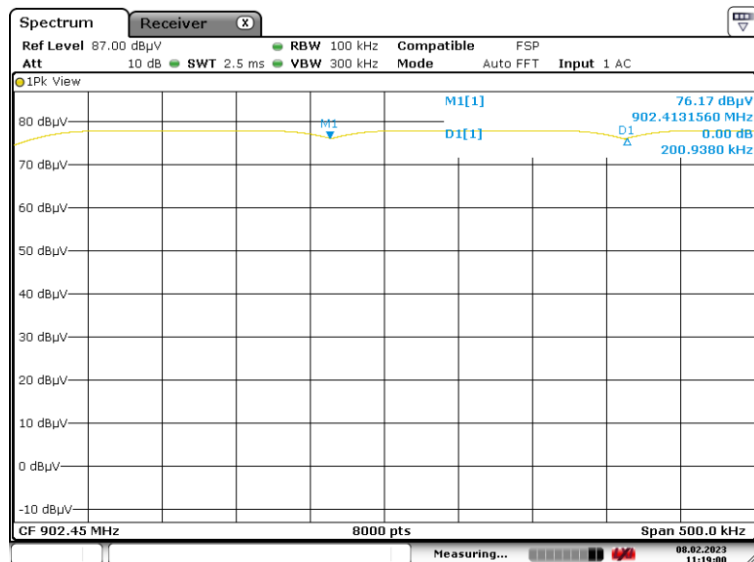
Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.247 a) (1) of FCC 47 CFR PART 15 : 2021 § 5.1 a) of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

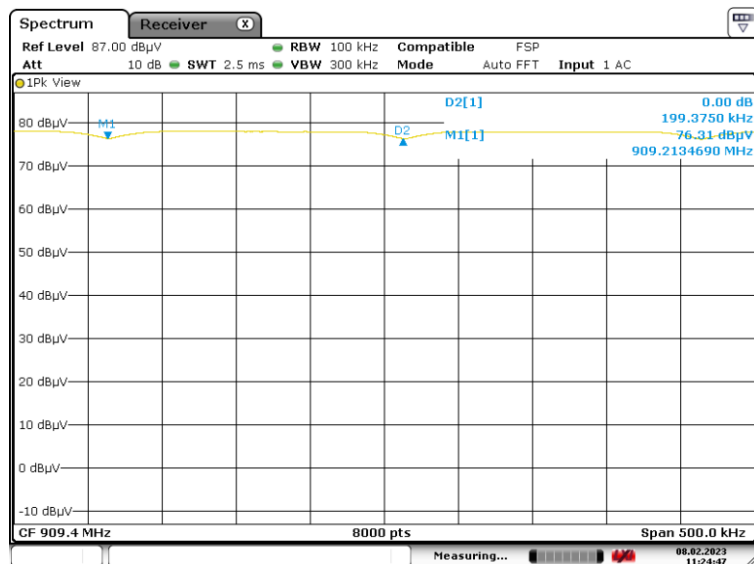
TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
03106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
08061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

Blank cells = Permanent validity

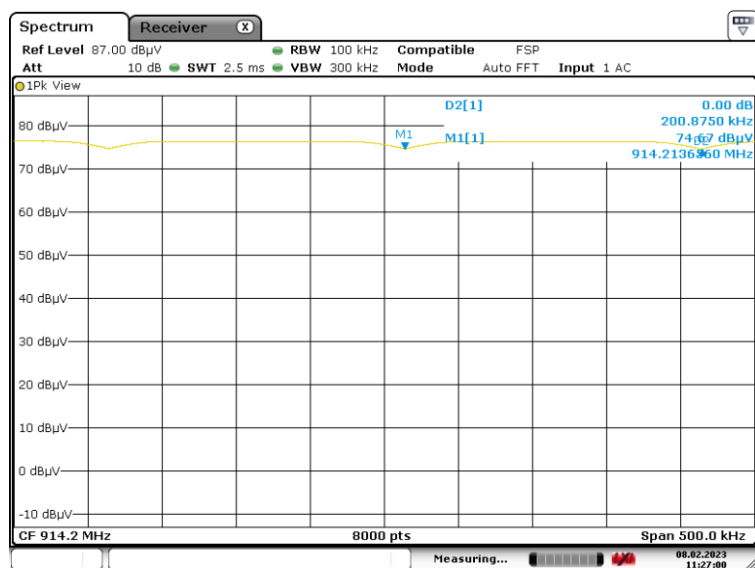
E.U.T. mode	Frequency	Channel separation Results (kHz)	Limit (kHz)
SF 10 ; bandwidth 125 kHz (FHS mode)	902.3 MHz	200.938	> 142.0
	908.7 MHz	199.375	> 142.0
	914.9 MHz	200.875	> 142.0



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Date: 8.FEB.2023 11:27:00

6.4. Number of Hopping Channel

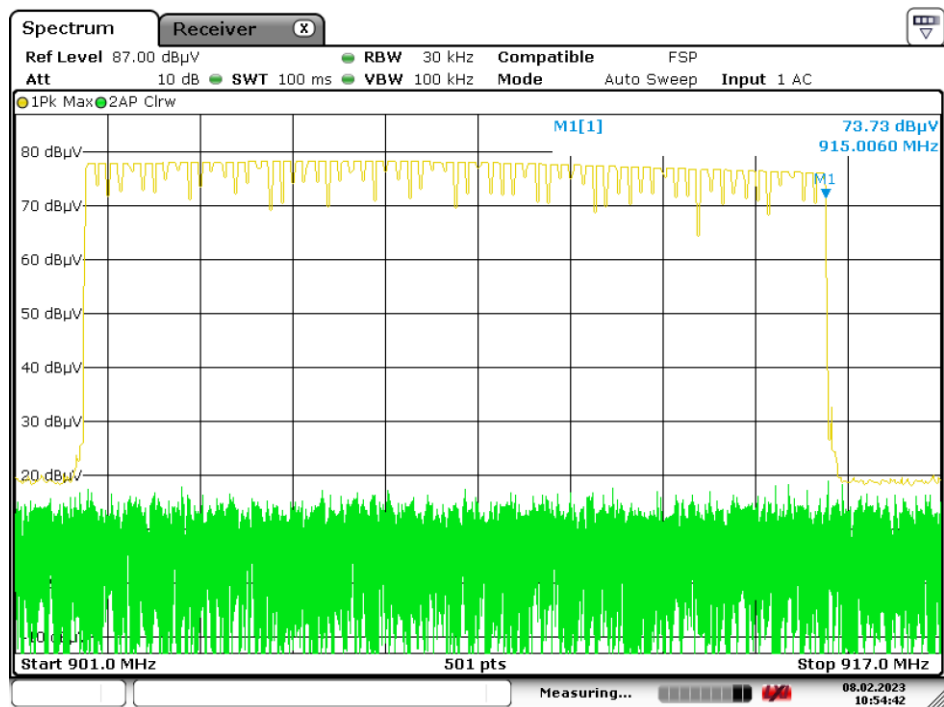
Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.247 a) (1) (i) of FCC 47 CFR PART 15 : 2021 § 5.1 c) of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
03106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
08061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

Blank cells = Permanent validity

E.U.T. mode	Number of hopping channels Results	Limit
SF 10 ; bandwidth 125 kHz (FHS mode)	64	> 50



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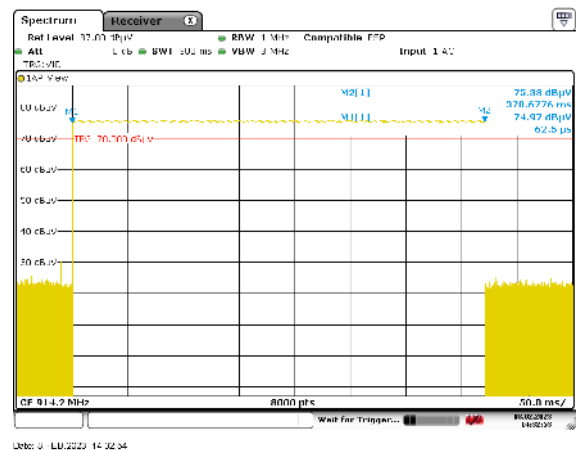
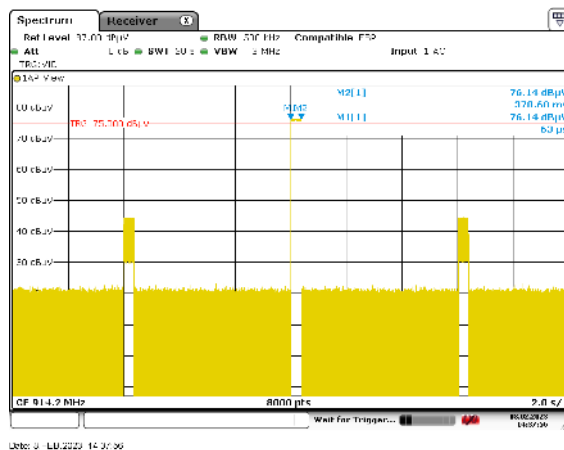
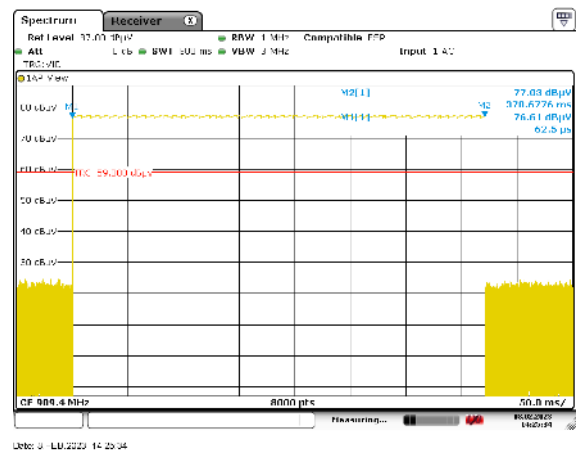
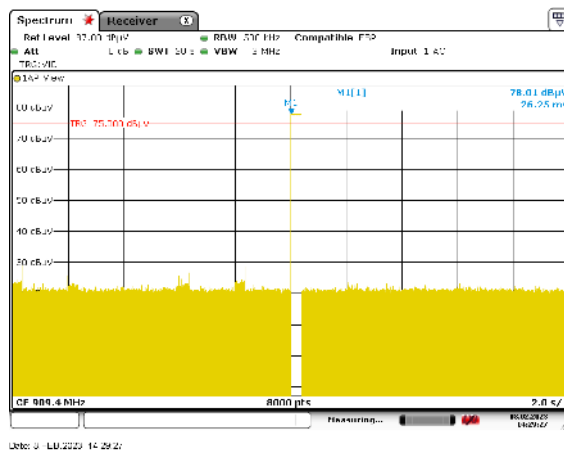
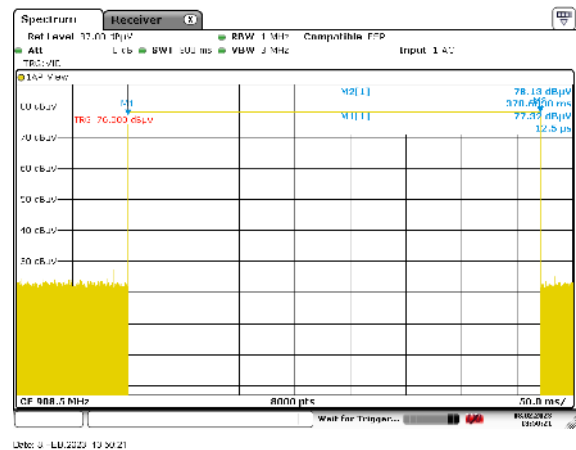
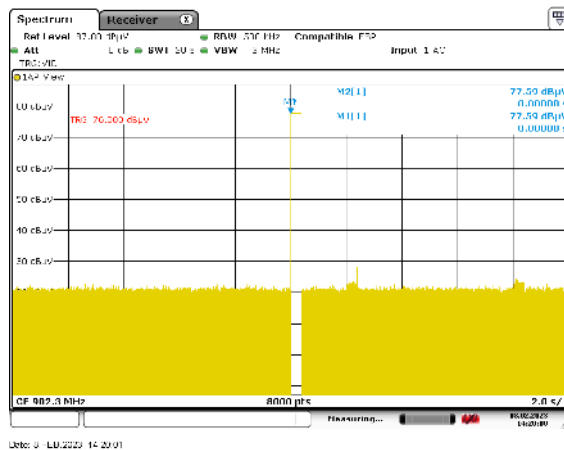
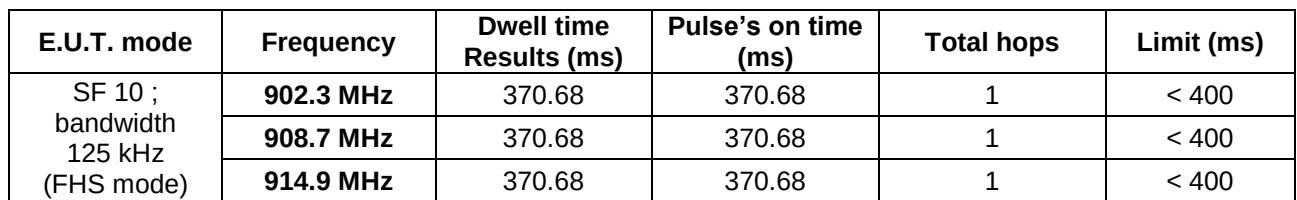
6.5. Dwell Time

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.247 a) (1) (i) of FCC 47 CFR PART 15 : 2021 § 5.1 c) of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
03106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
08061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

Blank cells = Permanent validity



6.6. Transmitter output power

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.247 b) (3) of FCC 47 CFR PART 15 : 2021 § 5.4 of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
03106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
08061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

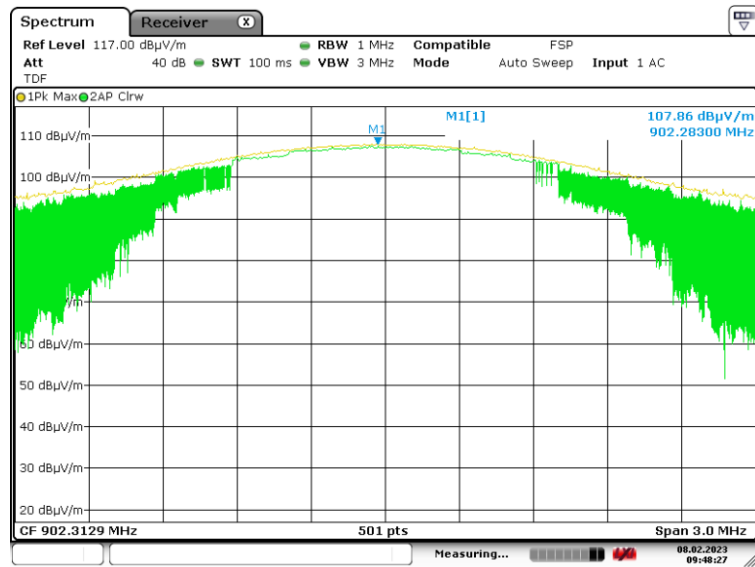
Blank cells = Permanent validity

E.U.T. mode	Frequency	Electro-magnetic field (dBμV/m)	TP* (dBm)	Limit (dBm)
SF 10 ; bandwidth 125 kHz (FHS mode)	902.3 MHz	107.83	+10.45	+ 30.0
	908.7 MHz	108.86	+11.48	+ 30.0
	914.9 MHz	107.55	+10.17	+ 30.0
SF 8 ; bandwidth 500 kHz (DTS mode)	903.0 MHz	104.02	+6.64	+ 30.0
	909.4 MHz	104.41	+7.03	+ 30.0
	914.2 MHz	102.73	+5.35	+ 30.0

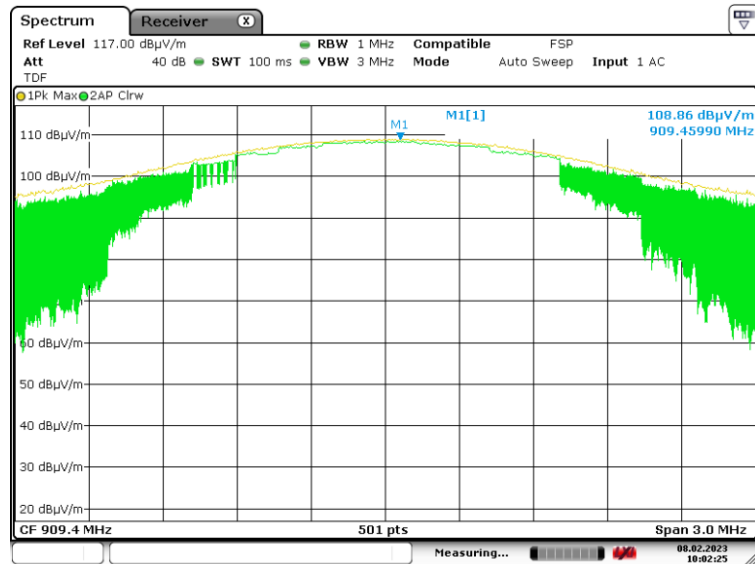
* TP = $(E \times d)^2 / (30 \times 1.64)$ for d = 3 m

E.U.T. position:

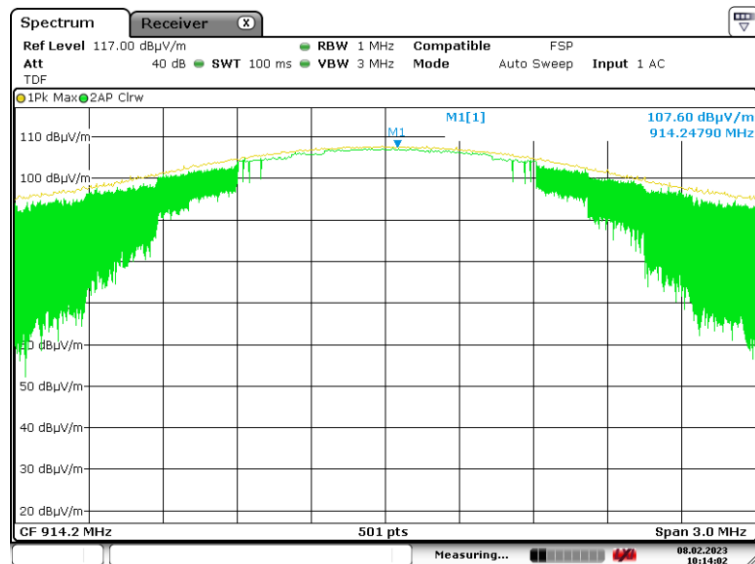




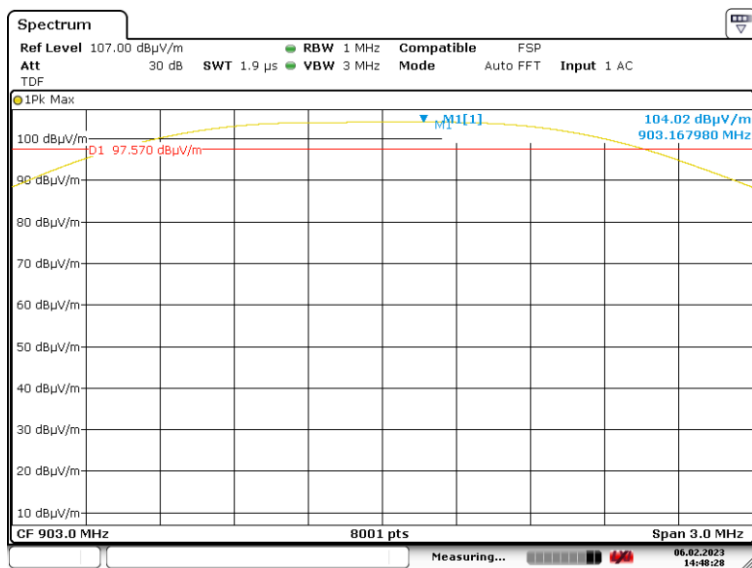
Date: 8.FEB.2023 09:48:27



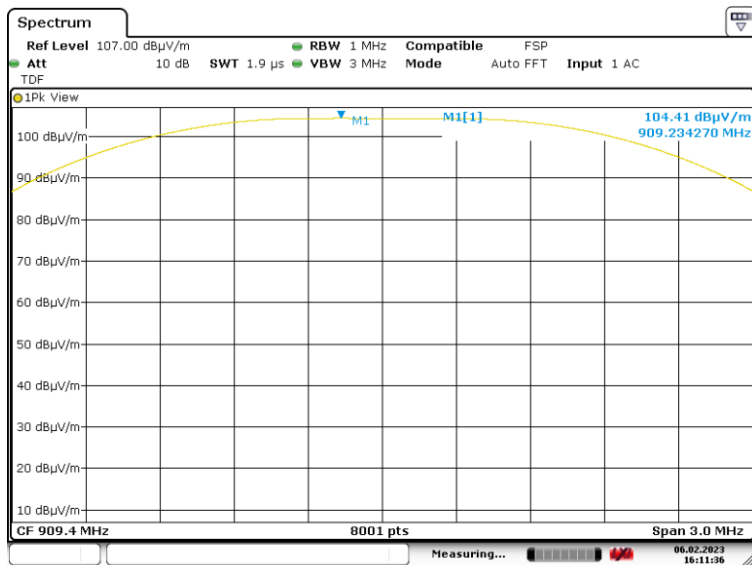
Date: 8.FEB.2023 10:02:25



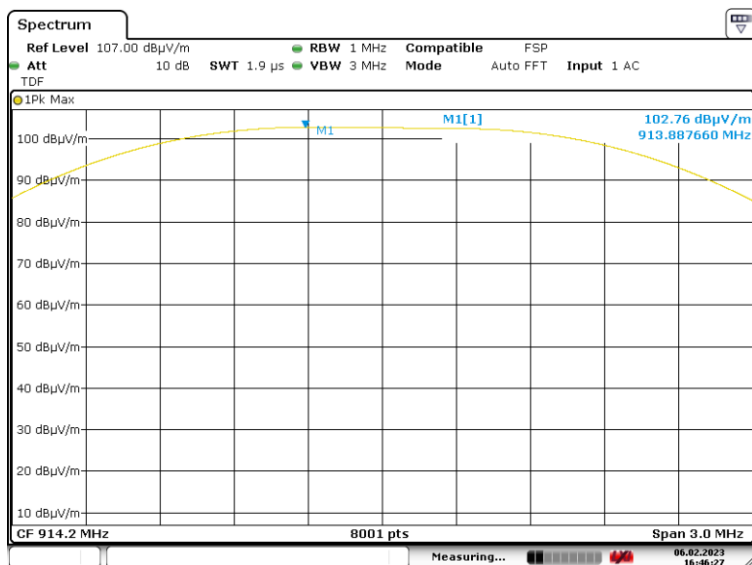
Date: 8.FEB.2023 10:14:03



Date: 6.FEB.2023 14:48:28



Date: 6.FEB.2023 16:11:37



Date: 6.FEB.2023 16:46:28

6.7. Peak power spectral density

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.247 e) of FCC 47 CFR PART 15 : 2021 § 5.2 b) of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

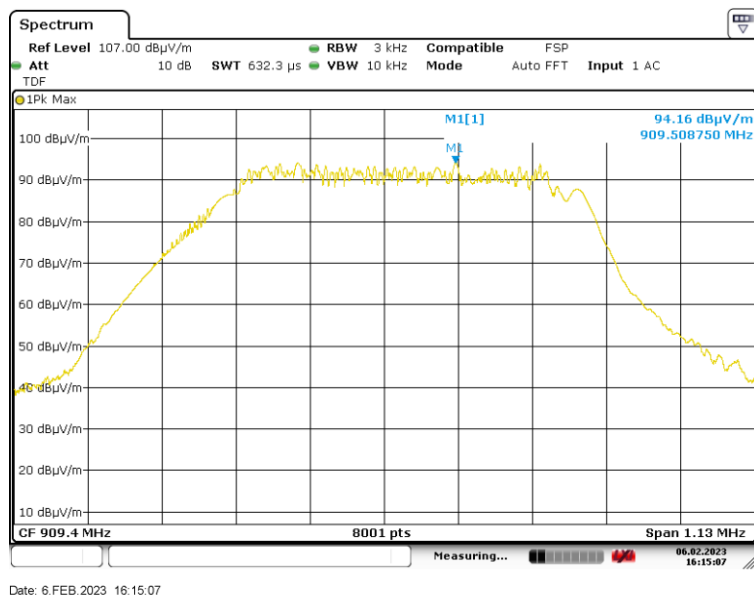
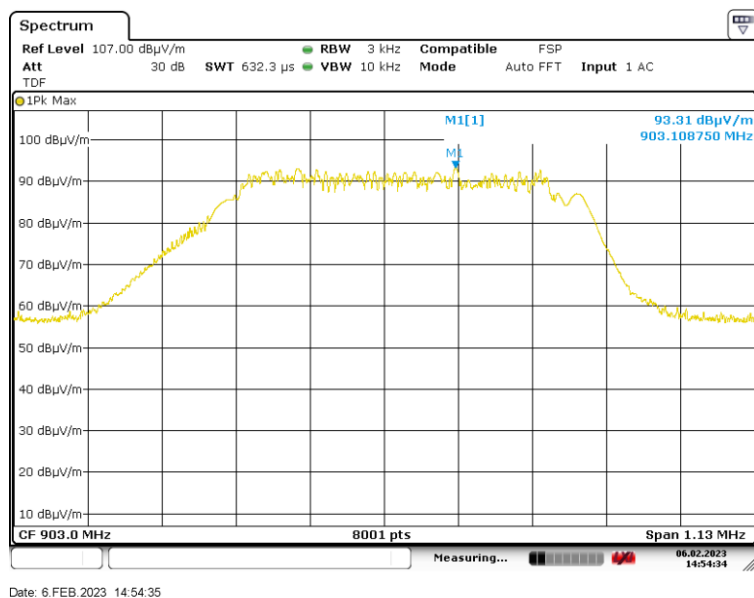
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

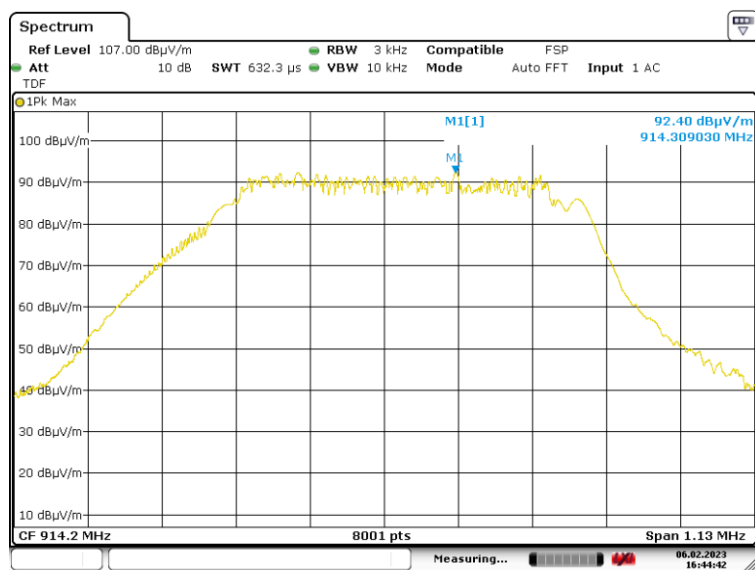
TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
03106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
08061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

Blank cells = Permanent validity

E.U.T. mode	Frequency	Electro-magnetic field (dBμV/m)	TP* (dBm)	Limit (dBm)
SF 8 ; bandwidth 500 kHz (DTS mode)	903.0 MHz	93.31	- 4.07	+ 8.0
	909.4 MHz	94.16	- 3.22	+ 8.0
	914.2 MHz	92.40	- 4.98	+ 8.0

* TP = $(E \times d)^2 / (30 \times 1.64)$ for d = 3 m





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6.8. Additional provisions to the general radiated emissions limitation

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-247 Issue 2 : 2017
Test method:	§ 15.215 b) and § 15.247 d) of FCC 47 CFR PART 15 : 2021 § 5.5 of RSS-247 Issue 2 : 2017
General test setup: E.U.T. is set on an insulating support at 80 cm above the ground reference plane. Measurement are done on a normalized test site. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	22°C
Relative Humidity	10 to 90 %	45%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

TEST EQUIPMENT USED					
Order Nr	Category	Manufacturer	Type	Last validity date	Next validity date
03106	Antenna	Schwarzbeck	UHALP 9108A	02/10/2020	02/12/2023
11184	Cable	C&C	N-5m	25/02/2022	25/04/2024
14226	Cable	C&C	N-4m	25/02/2022	25/04/2024
11417	Cable	Huber + Suhner	N-2m	25/02/2022	25/04/2024
08061	Cable	Micro-Coax	N-8m	25/02/2022	25/04/2024
16693	Power supply	Delta Elektronika	SM52-30		
14622	Shielded enclosure	Comtest	SAC 3m	27/04/2022	27/06/2025
12811	Spectrum analyzer	Rohde & Schwarz	ESR7	11/03/2022	11/05/2023

Blank cells = Permanent validity

Band Edge measurement :

For FHS mode

Polarization of test antenna: Vertical (height = 100 cm) } For 902.3 MHz
Position of equipment: azimuth = 220° }

Polarization of test antenna: Vertical (height = 110 cm) } For 914.9 MHz
Position of equipment: azimuth = 210° }

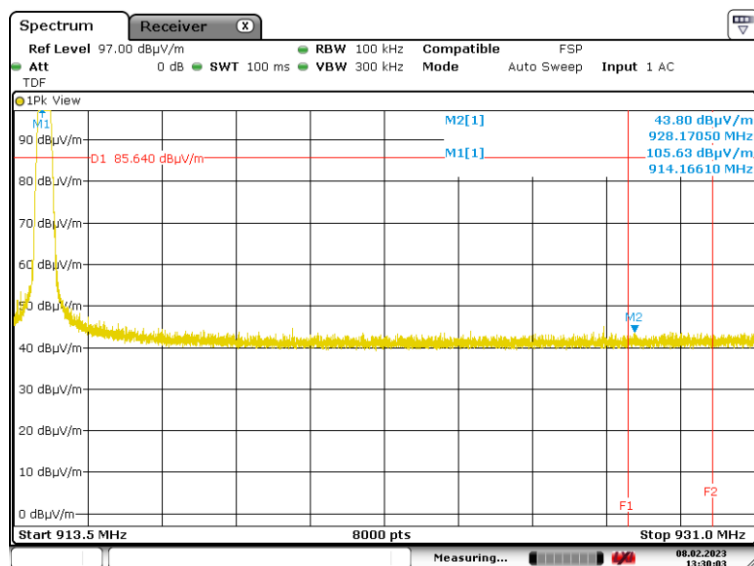
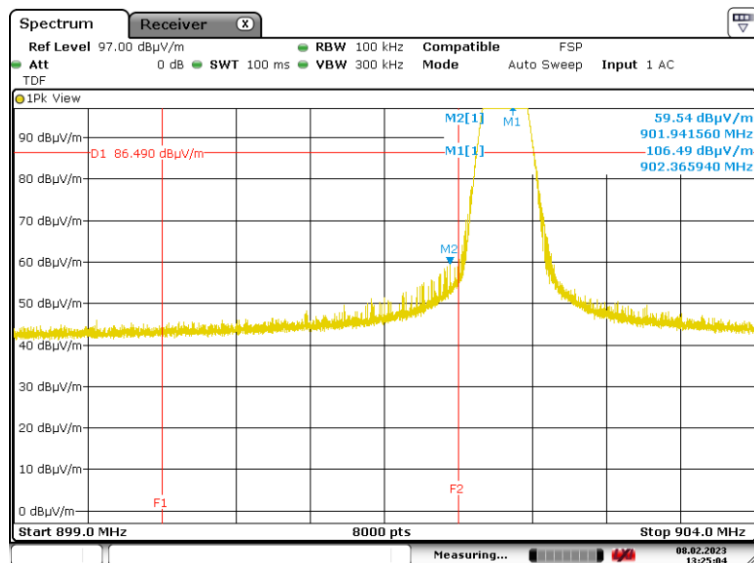
For DTS mode

Polarization of test antenna: Vertical (height = 100 cm) } For 903.0 MHz
Position of equipment: azimuth = 220° }

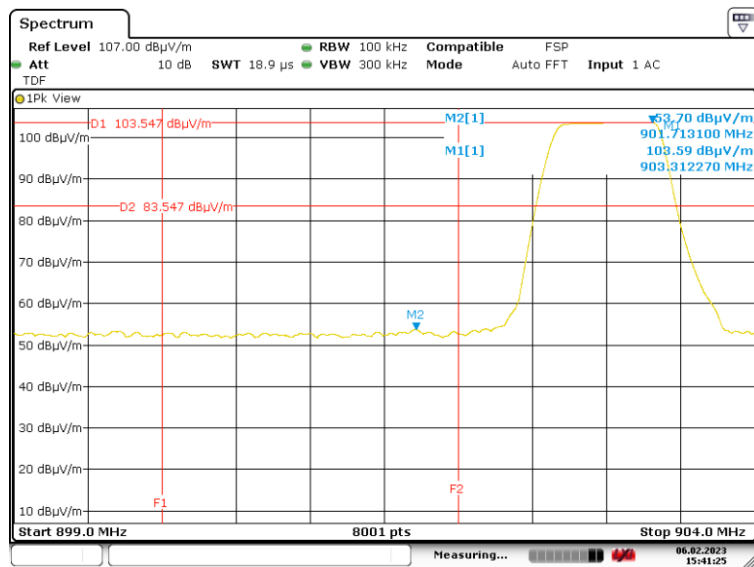
Polarization of test antenna: Vertical (height = 100 cm) } For 914.2 MHz
Position of equipment: azimuth = 220° }

E.U.T. mode	Frequency (MHz)	Field Strength Level of fundamental (dBμV/m)	Detector (Peak or Average)	Frequency of maximum Band-edges Emission (MHz)	Calculated Max Out of Band Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
SF 10 ; bandwidth 125 kHz (FHS mode)	902.366	106.49	Peak	901.941	59.54	86.49	26.95
	914.166	105.63	Peak	928.170	43.80	85.64	41.84
SF 8 ; bandwidth 500 kHz (DTS mode)	903.312	103.55	Peak	901.713	53.70	83.55	29.85
	914.000	102.68	Peak	928.082	52.94	82.68	29.74

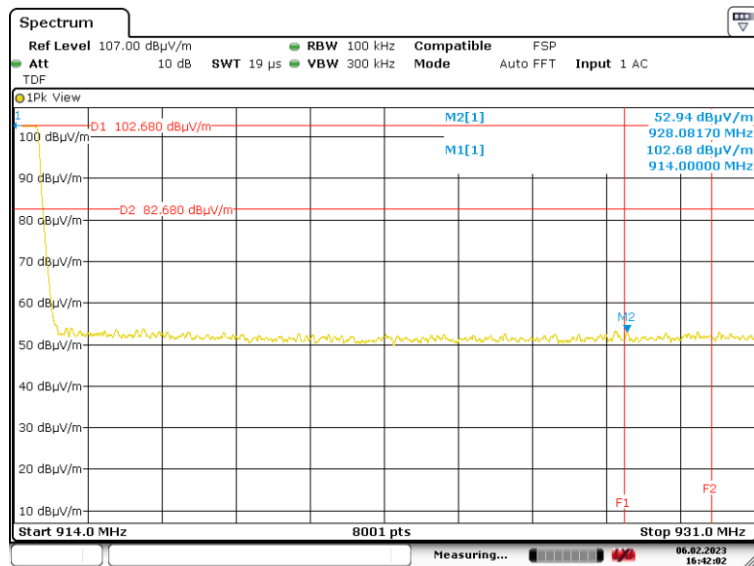
For FHS mode



For DTS mode



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6.9. Unintentional radiated emissions and transmitter unwanted emission in the band 9 kHz – 10 GHz

Reference standard:	FCC 47 CFR PART 15 : 2021 RSS-Gen Issue 5 : 2019
Test method:	§ 15.205; § 15.209 and § 15.247 of FCC 47 CFR PART 15 : 2021 § 6.13 of RSS-Gen Issue 5 : 2019
General test setup: E.U.T. is set on an insulating support at 0.8 m (<1GHz) and 1.5 m (>1GHz) above the ground reference plane. For maximum meter reading at each frequency, the antenna height is adjusted between 1 m and 4 m above the ground plane for 9 kHz - 10 GHz. A 360 degrees rotation of the EUT is performed in vertical and horizontal polarization.	

TESTED CONFIGURATION	PARAMETER	VERDICT
Maxhold 360° - Tx 902.3 MHz channel - FHS mode	9kHz-30MHz	PASS
Maxhold 360° - Tx 908.7 MHz channel - FHS mode	9kHz-30MHz	PASS
Maxhold 360° - Tx 914.9 MHz channel - FHS mode	9kHz-30MHz	PASS
Maxhold 360° - Tx 903.0 MHz channel - DTS mode	9kHz-30MHz	PASS
Maxhold 360° - Tx 909.4 MHz channel - DTS mode	9kHz-30MHz	PASS
Maxhold 360° - Tx 914.2 MHz channel - DTS mode	9kHz-30MHz	PASS
Maxhold 360° - Tx 902.3 MHz channel - FHS mode	30MHz-1GHz	PASS
Maxhold 360° - Tx 908.7 MHz channel - FHS mode	30MHz-1GHz	PASS
Maxhold 360° - Tx 914.9 MHz channel - FHS mode	30MHz-1GHz	PASS
Maxhold 360° - Tx 903.0 MHz channel - DTS mode	30MHz-1GHz	PASS
Maxhold 360° - Tx 909.4 MHz channel - DTS mode	30MHz-1GHz	PASS
Maxhold 360° - Tx 914.2 MHz channel - DTS mode	30MHz-1GHz	PASS
Maxhold 360° - Tx 902.3 MHz channel - FHS mode	1GHz-10GHz	PASS
Maxhold 360° - Tx 908.7 MHz channel - FHS mode	1GHz-10GHz	PASS
Maxhold 360° - Tx 914.9 MHz channel - FHS mode	1GHz-10GHz	PASS
Maxhold 360° - Tx 903.0 MHz channel - DTS mode	1GHz-10GHz	PASS
Maxhold 360° - Tx 909.4 MHz channel - DTS mode	1GHz-10GHz	PASS
Maxhold 360° - Tx 914.2 MHz channel - DTS mode	1GHz-10GHz	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	10 to 40 °C	23°C
Relative Humidity	10 to 90 %	37%
Atmospheric pressure	N/A	N/A hPa
Test method deviation: No		
Supplementary information: -		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Amplifier	HP	8449B	16922	06/04/2022	06/06/2023
Amplifier	Mini-circuit	ZFL-1000LN	00048	11/02/2022	11/04/2023
Antenna	ETS-Lindgren	3117	16000	18/01/2022	18/03/2025
Antenna	Emco	6502	09579	13/01/2023	13/03/2025
Antenna	Schwarzbeck	UHALP 9108A	03106	02/10/2020	02/12/2023
Antenna	Schwarzbeck	VHA 9103	03426	05/10/2020	05/12/2023
Cable	C&C	K-2m	11133	28/09/2022	28/11/2024
Cable	C&C	K-4m	11135	28/09/2022	28/11/2024
Cable	C&C	N-5m	11184	25/02/2022	25/04/2024
Cable	C&C	N-4m	14226	25/02/2022	25/04/2024
Cable	Micro-Coax	N-8m	08061	25/02/2022	25/04/2024
Cable	Huber + Suhner	N-2m	11417	25/02/2022	25/04/2024
Filter	Trilithic	6HC1300-2.5-KK	01097	13/06/2022	13/08/2025
Power supply	Delta Elektronika	SM52-30	16693		
Receiver	Rohde & Schwarz	ESW44	17058	28/03/2022	28/05/2023
Shielded enclosure	Comtest	SAC 3m	14622	27/04/2022	27/06/2025
Software	Nexio	BAT EMC	00000		
Spectrum analyzer	Rohde & Schwarz	ESR7	12811	11/03/2022	11/05/2023

BAT-EMC software version: V3.18.0.26

Blank cells = Permanent validity

TEST SETUP PHOTOS - 9 KHz – 30 MHz



TEST SETUP PHOTOS - 9 kHz – 30 MHz



TEST SETUP PHOTOS - 30 MHz – 1 GHz

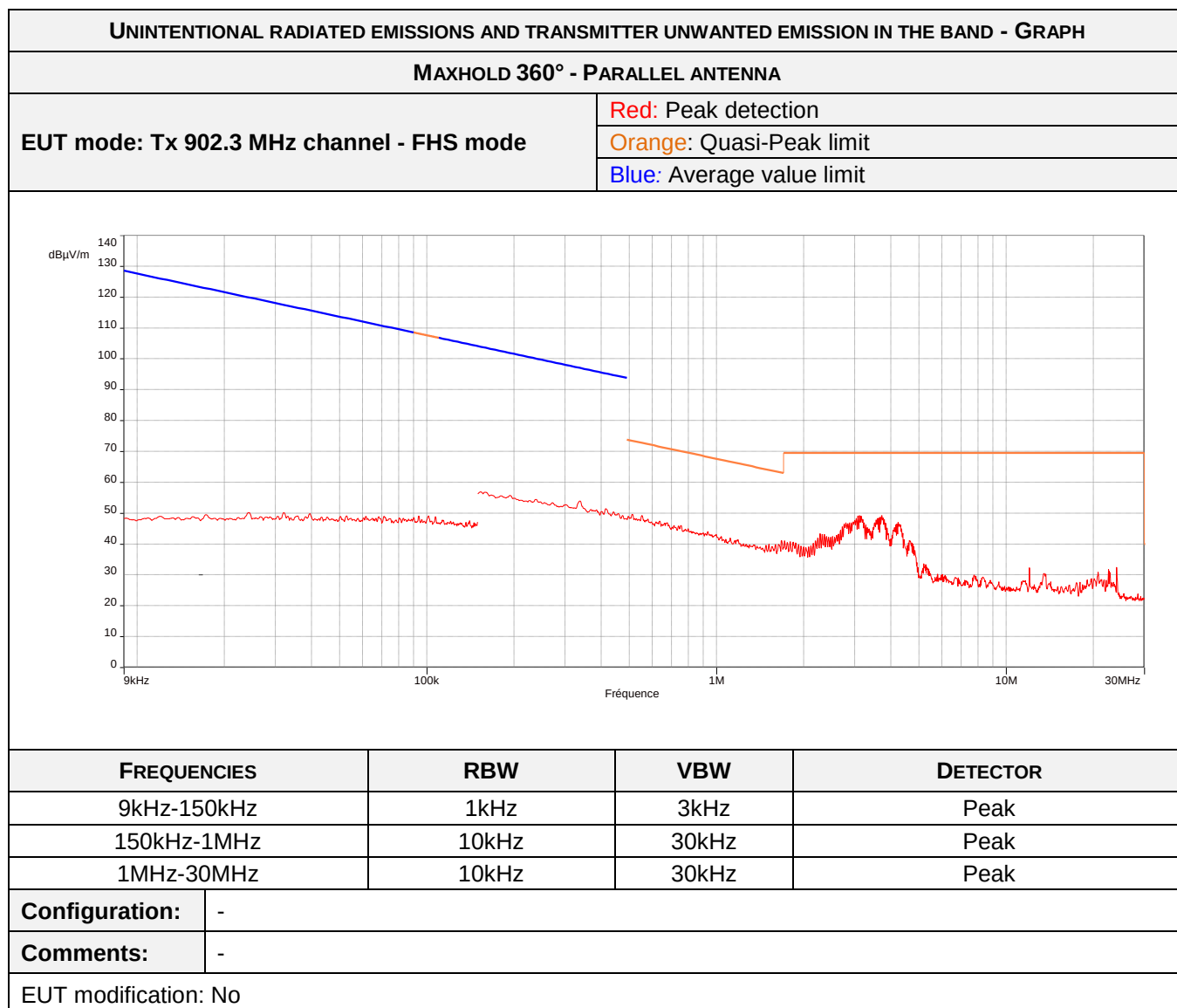


TEST SETUP PHOTOS - 30 MHz – 1 GHz

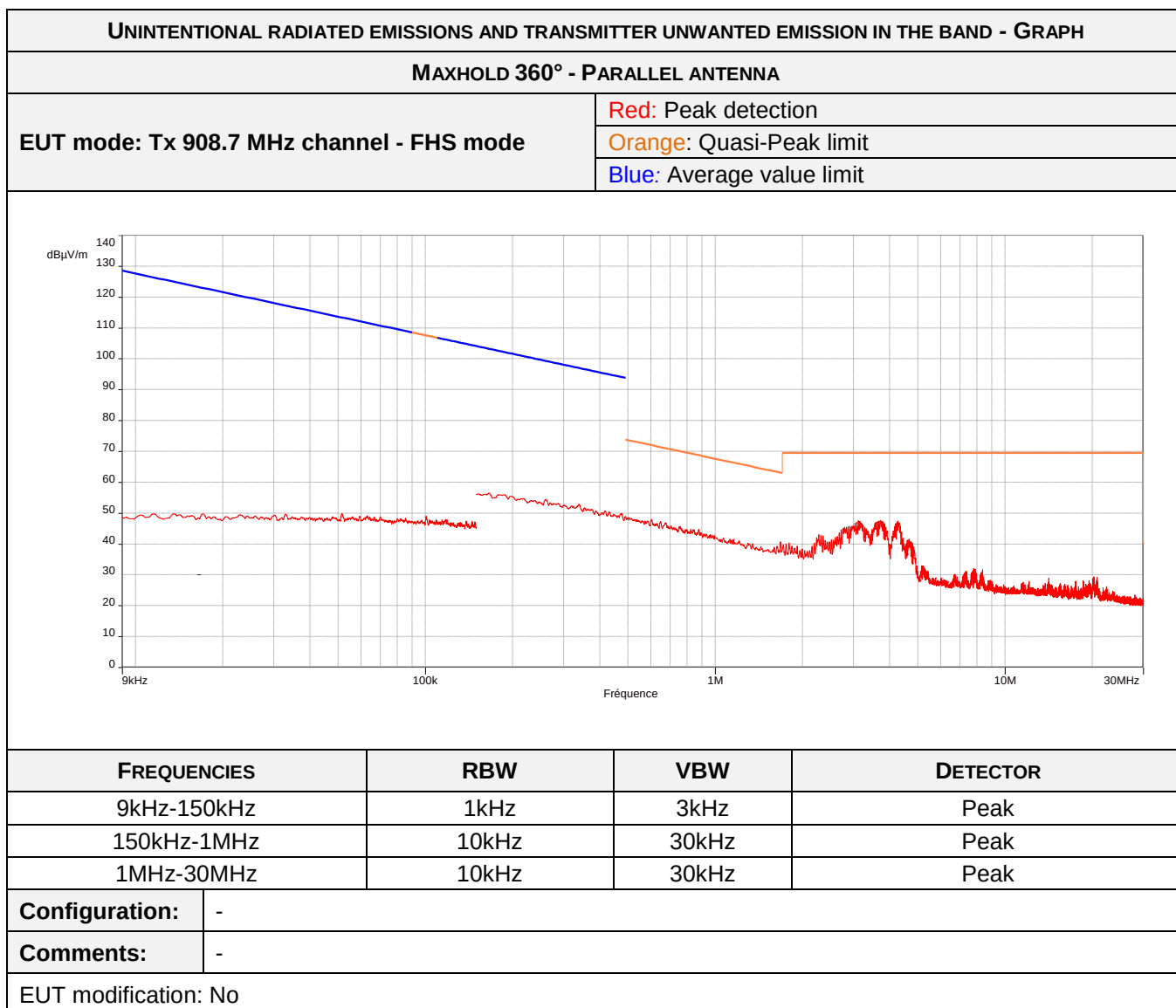


TEST SETUP PHOTOS - 1 GHz – 10 GHz

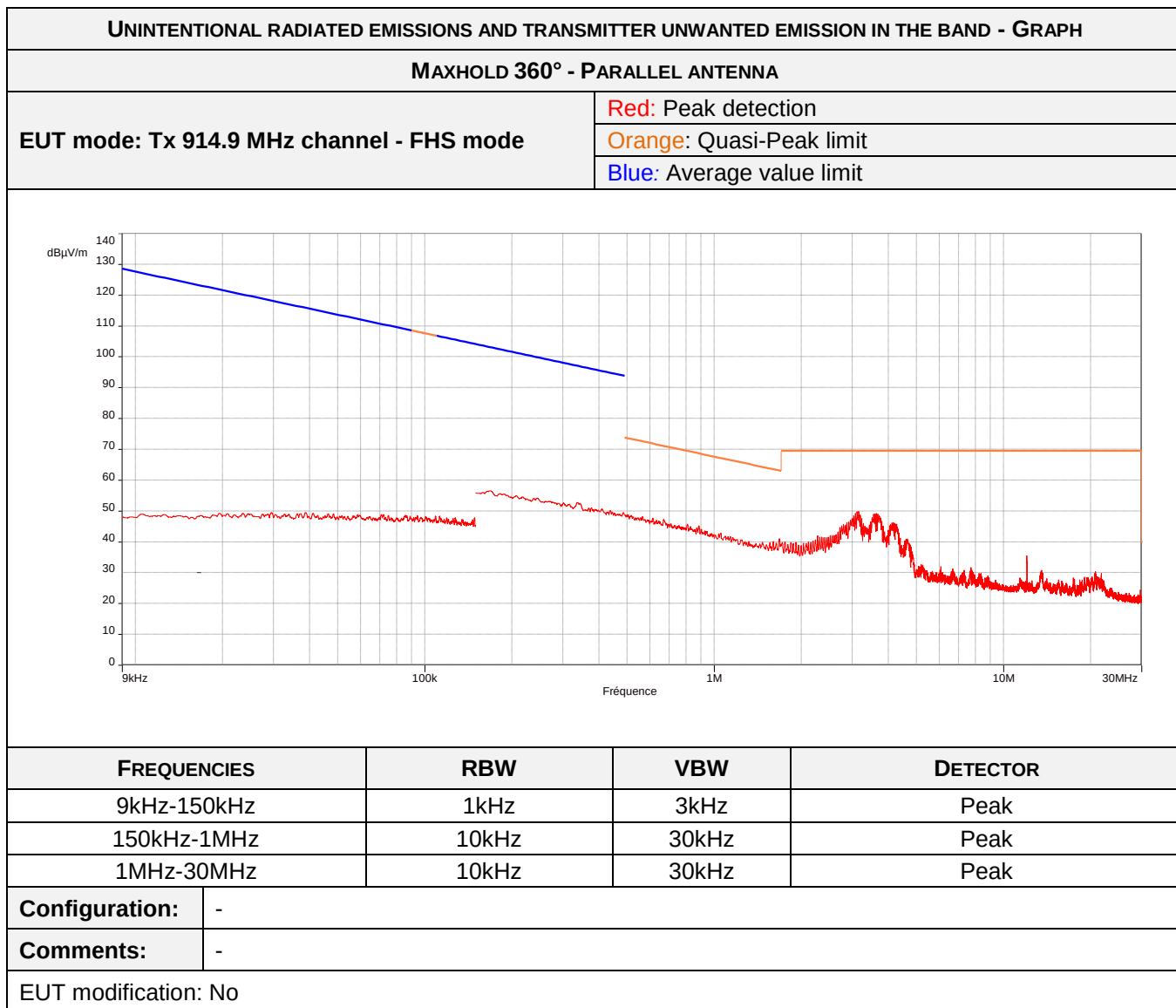




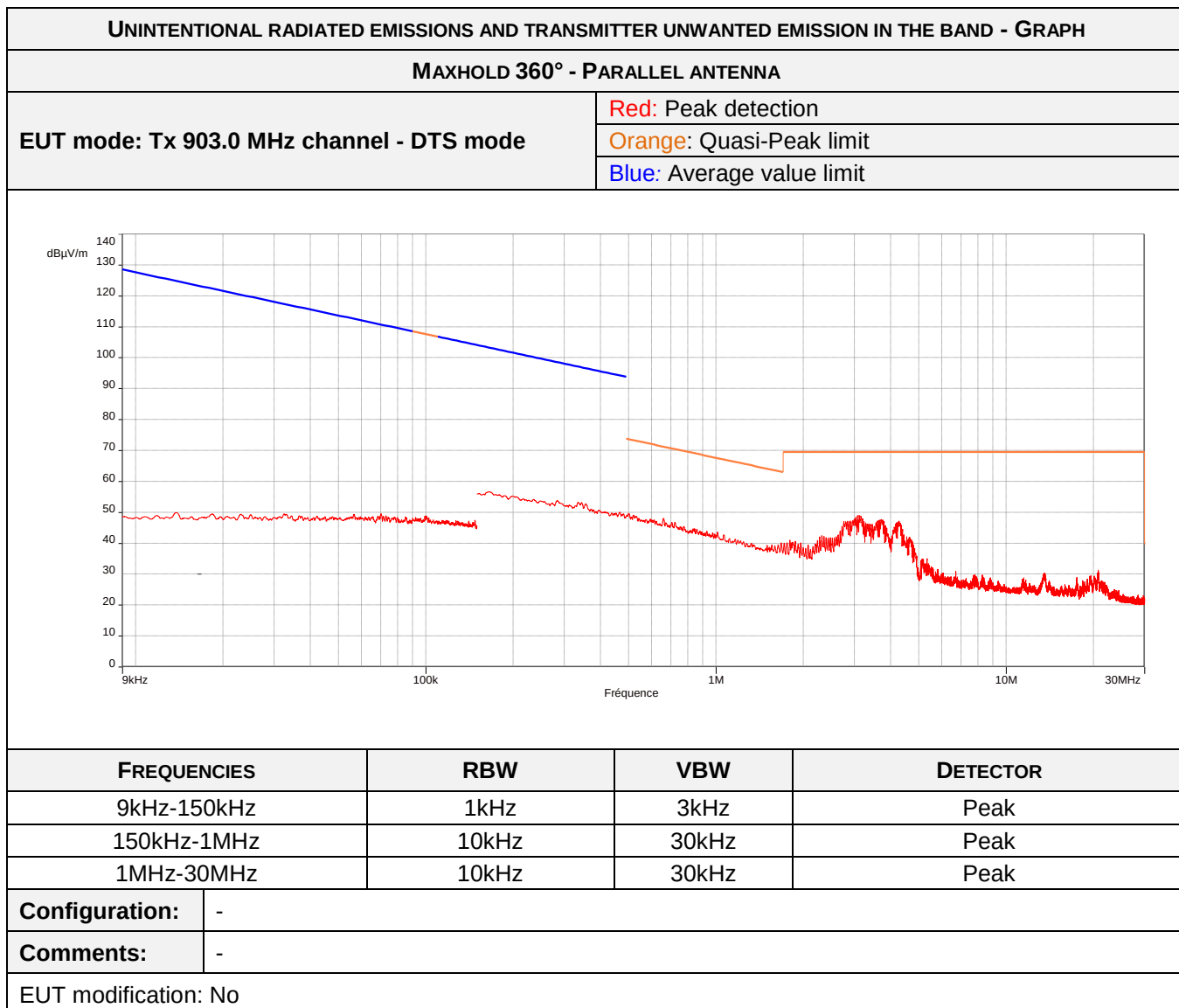
For an orientation of the antenna at 45° and perpendicular, the measurements are performed manually. No different result compared to the measurement with the antenna in parallel.



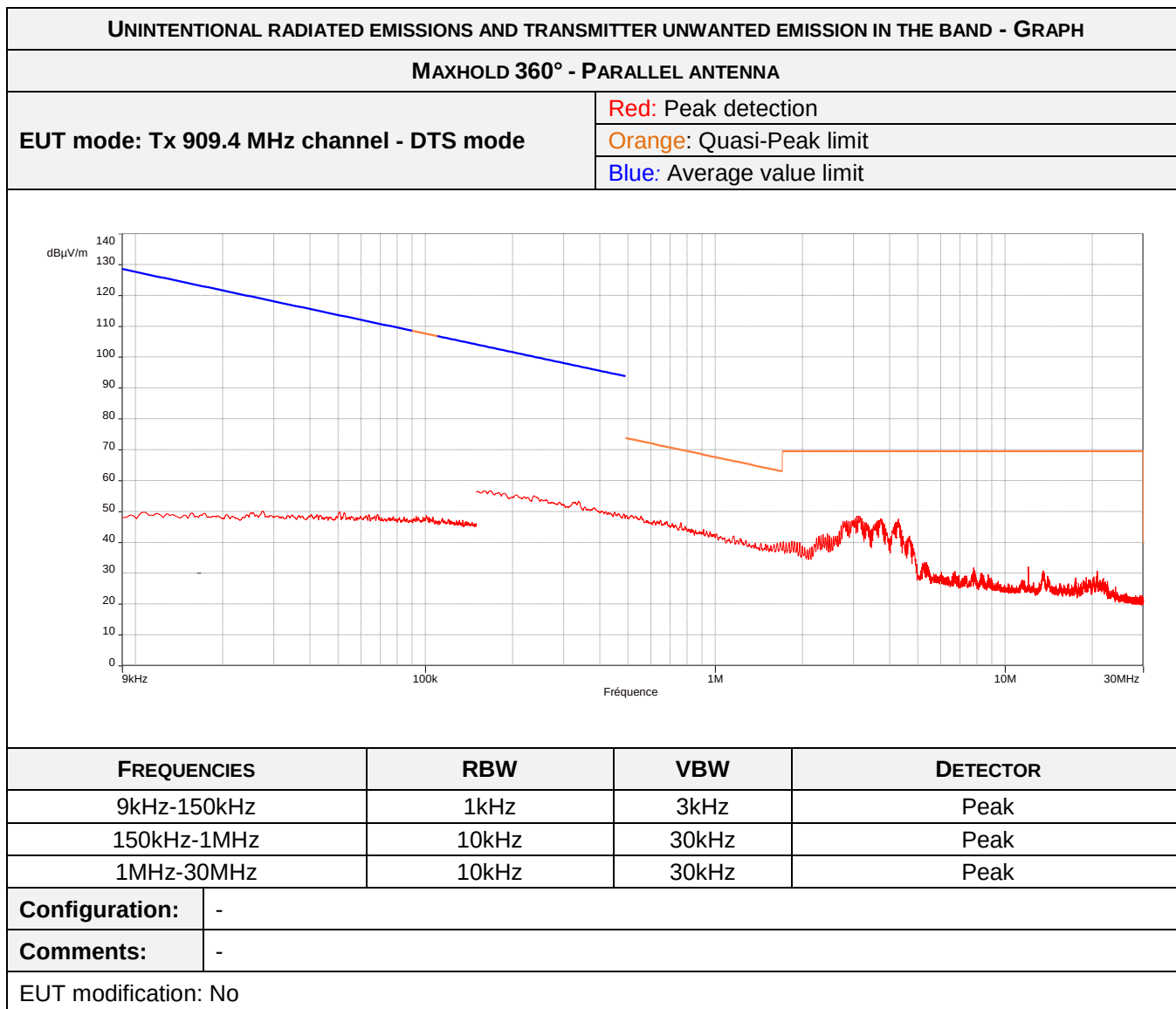
For an orientation of the antenna at 45° and perpendicular, the measurements are performed manually. No different result compared to the measurement with the antenna in parallel.



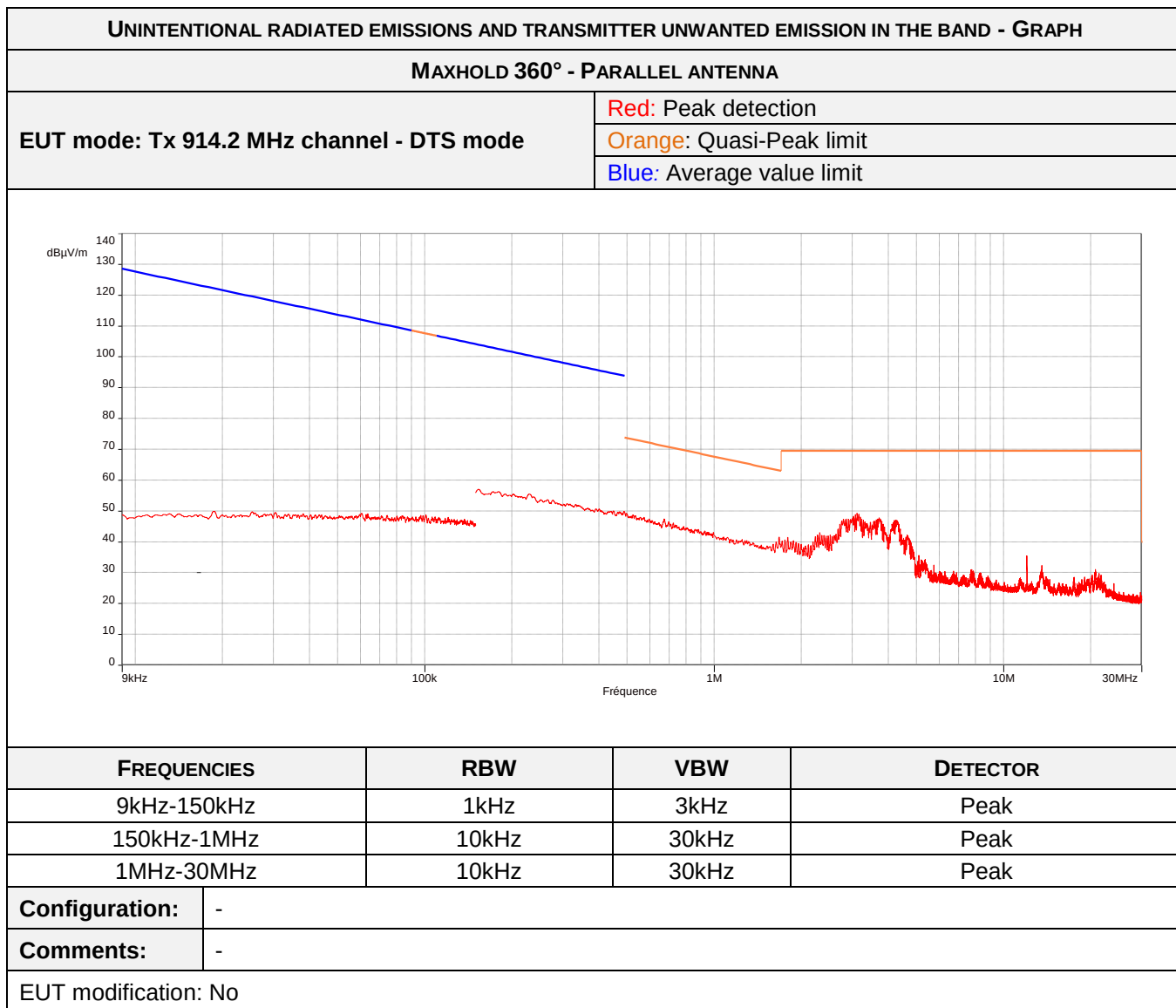
For an orientation of the antenna at 45° and perpendicular, the measurements are performed manually. No different result compared to the measurement with the antenna in parallel.



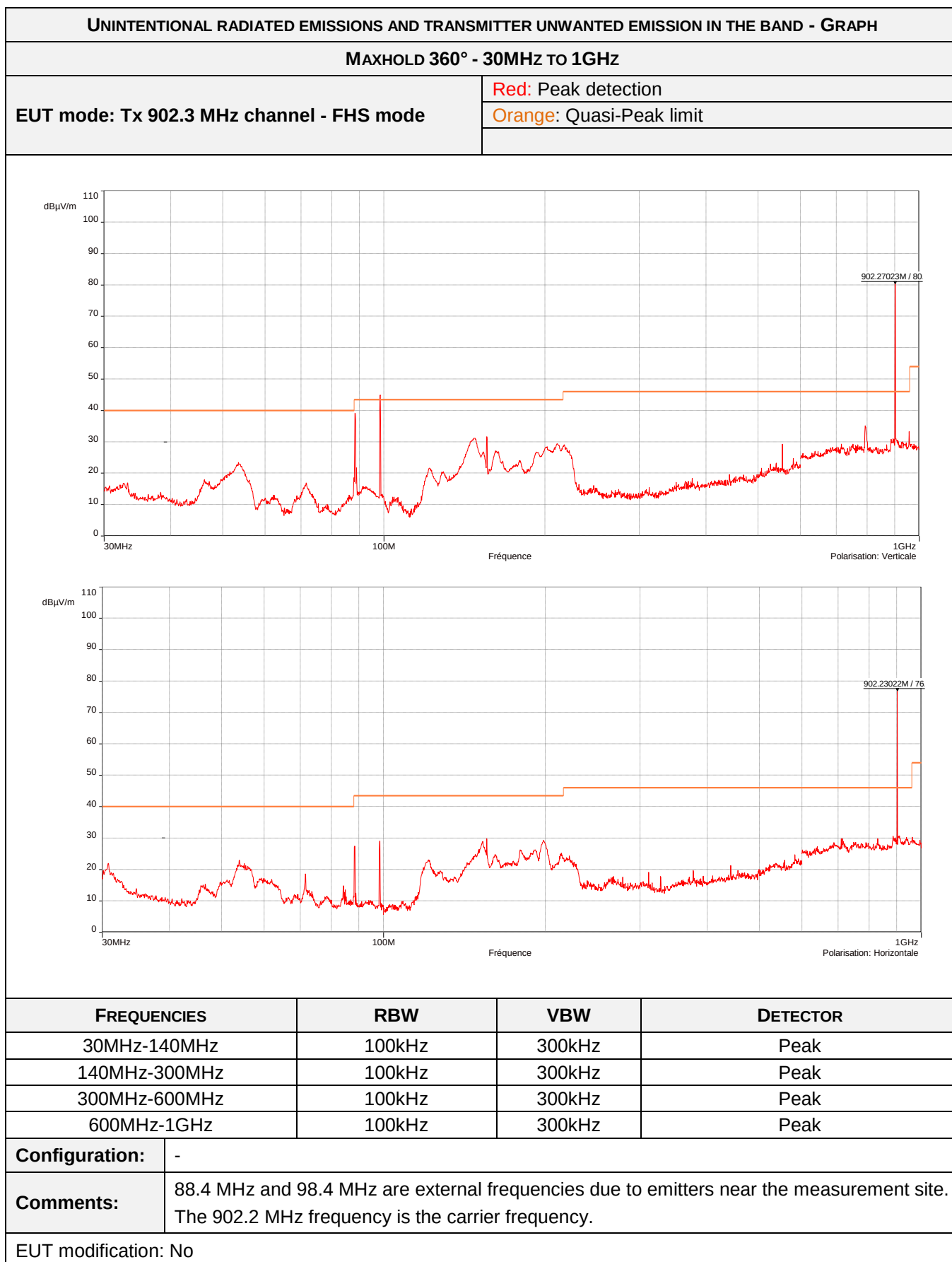
For an orientation of the antenna at 45° and perpendicular, the measurements are performed manually. No different result compared to the measurement with the antenna in parallel.

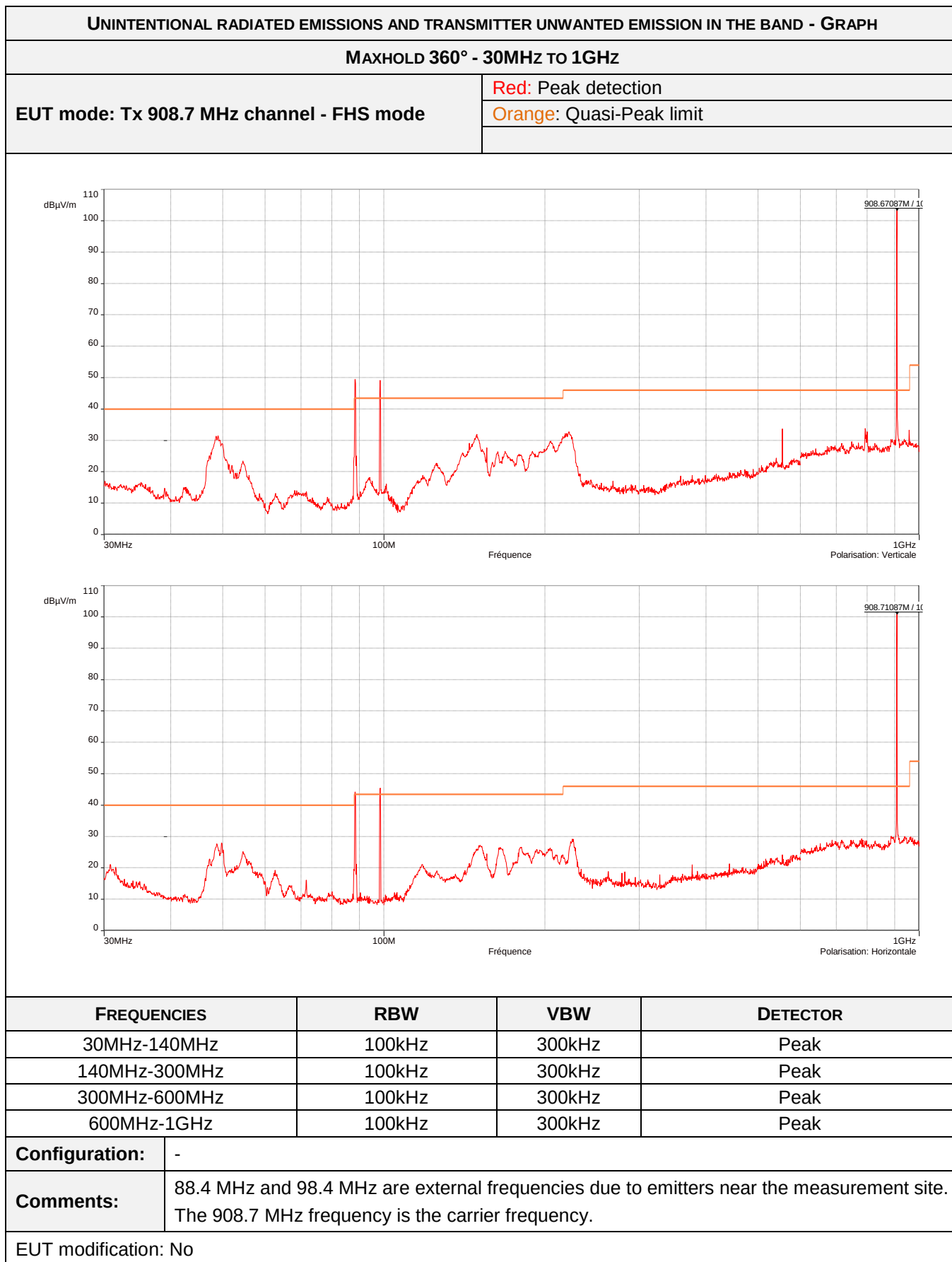


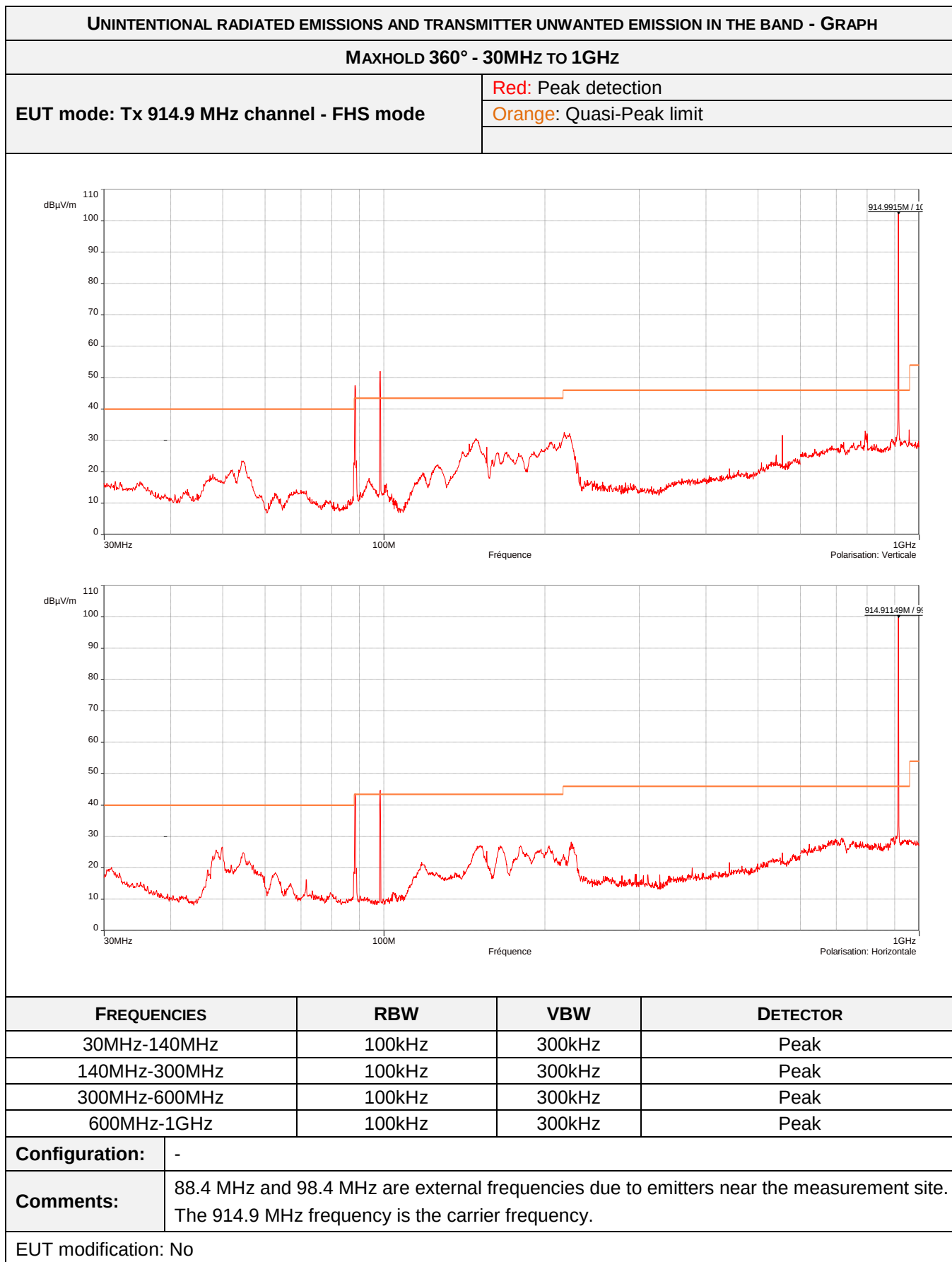
For an orientation of the antenna at 45° and perpendicular, the measurements are performed manually. No different result compared to the measurement with the antenna in parallel.

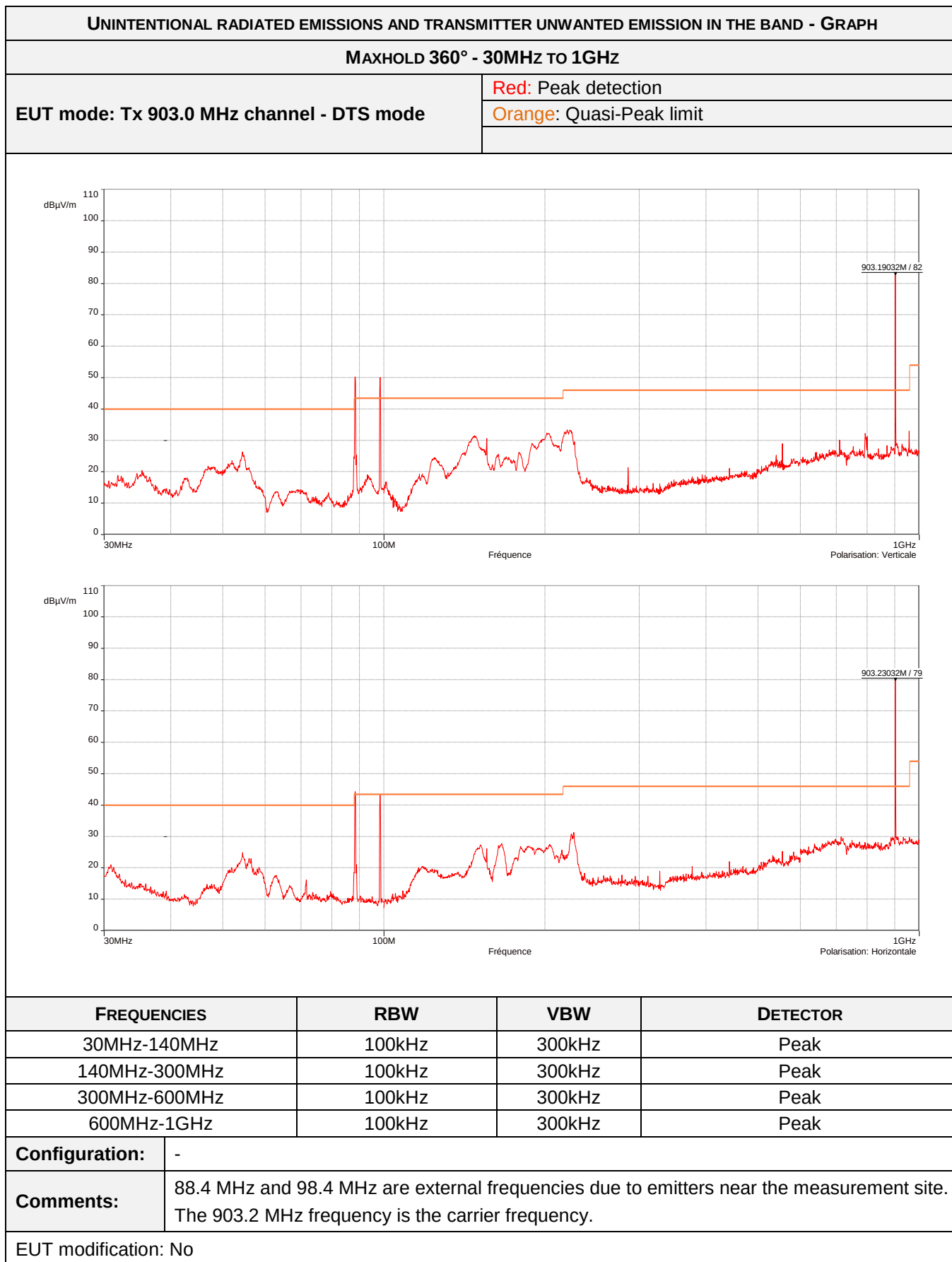


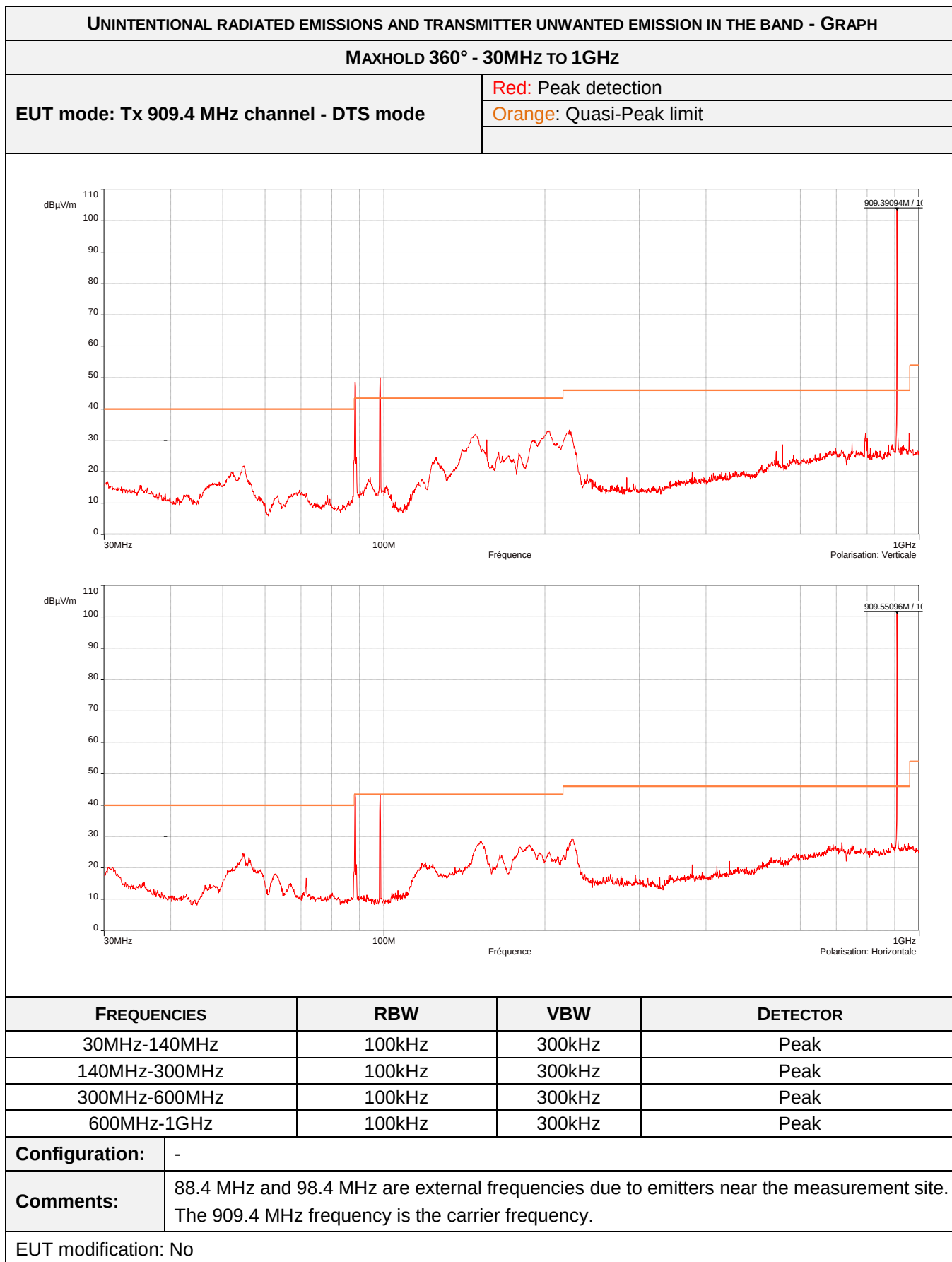
For an orientation of the antenna at 45° and perpendicular, the measurements are performed manually. No different result compared to the measurement with the antenna in parallel.

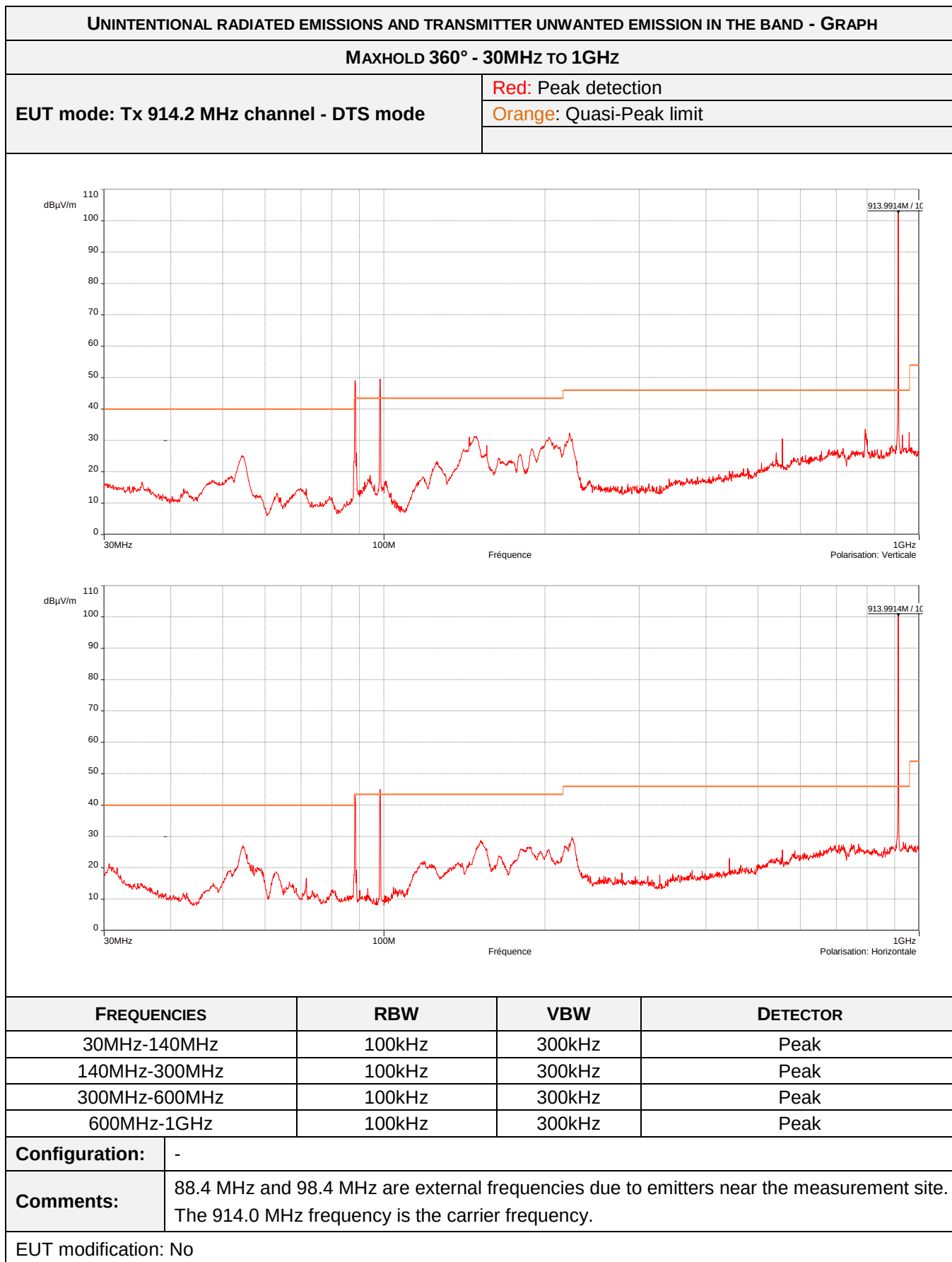


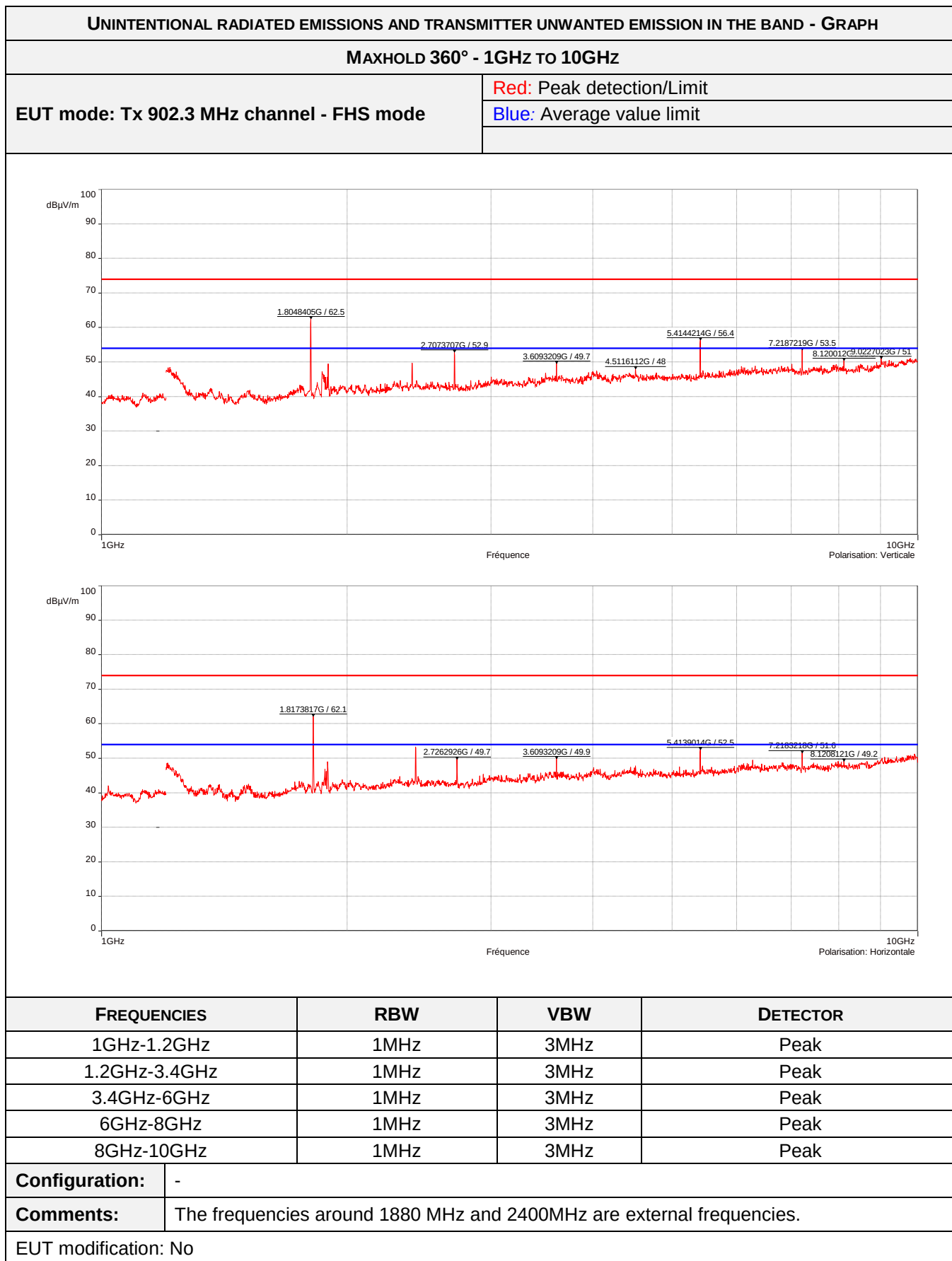


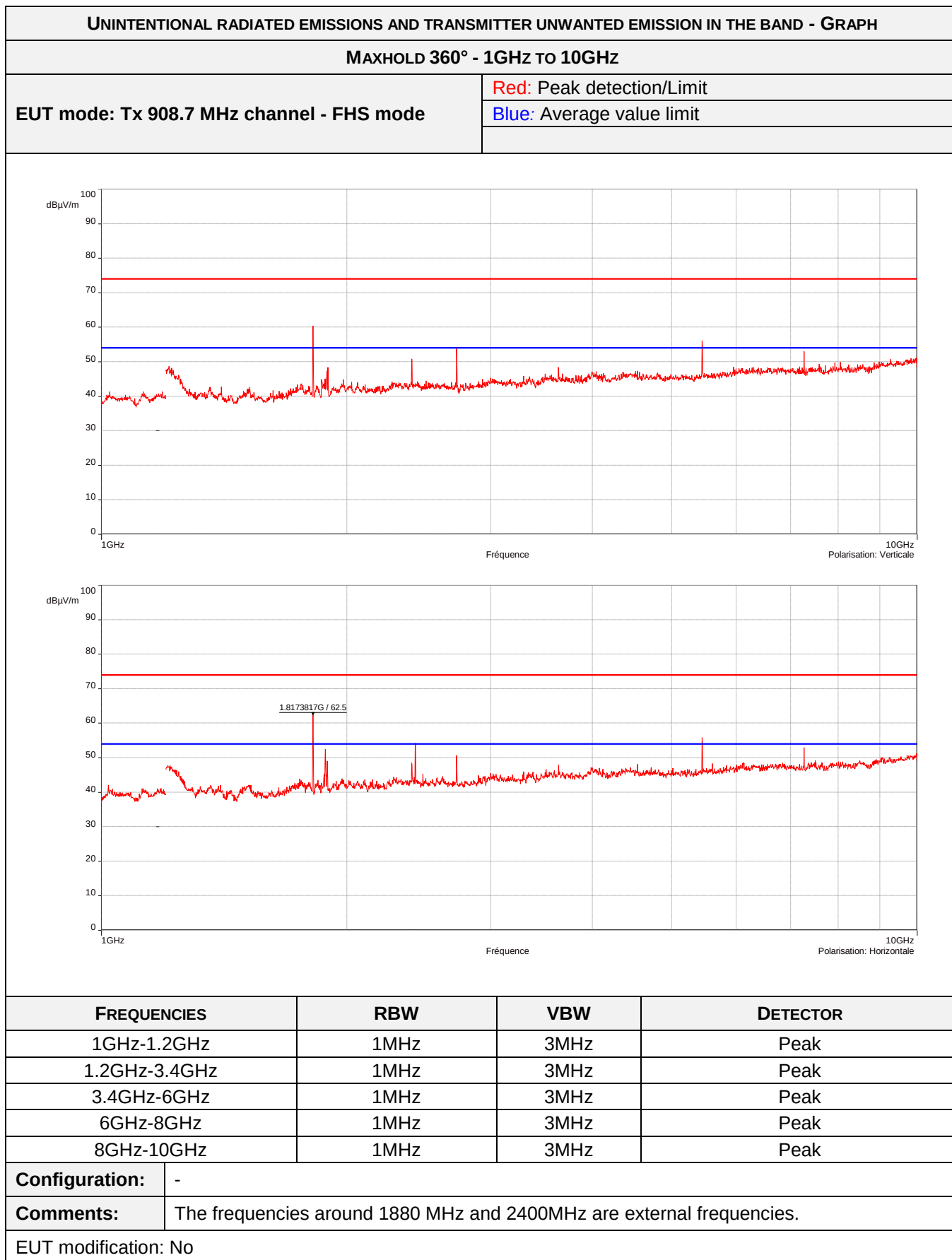


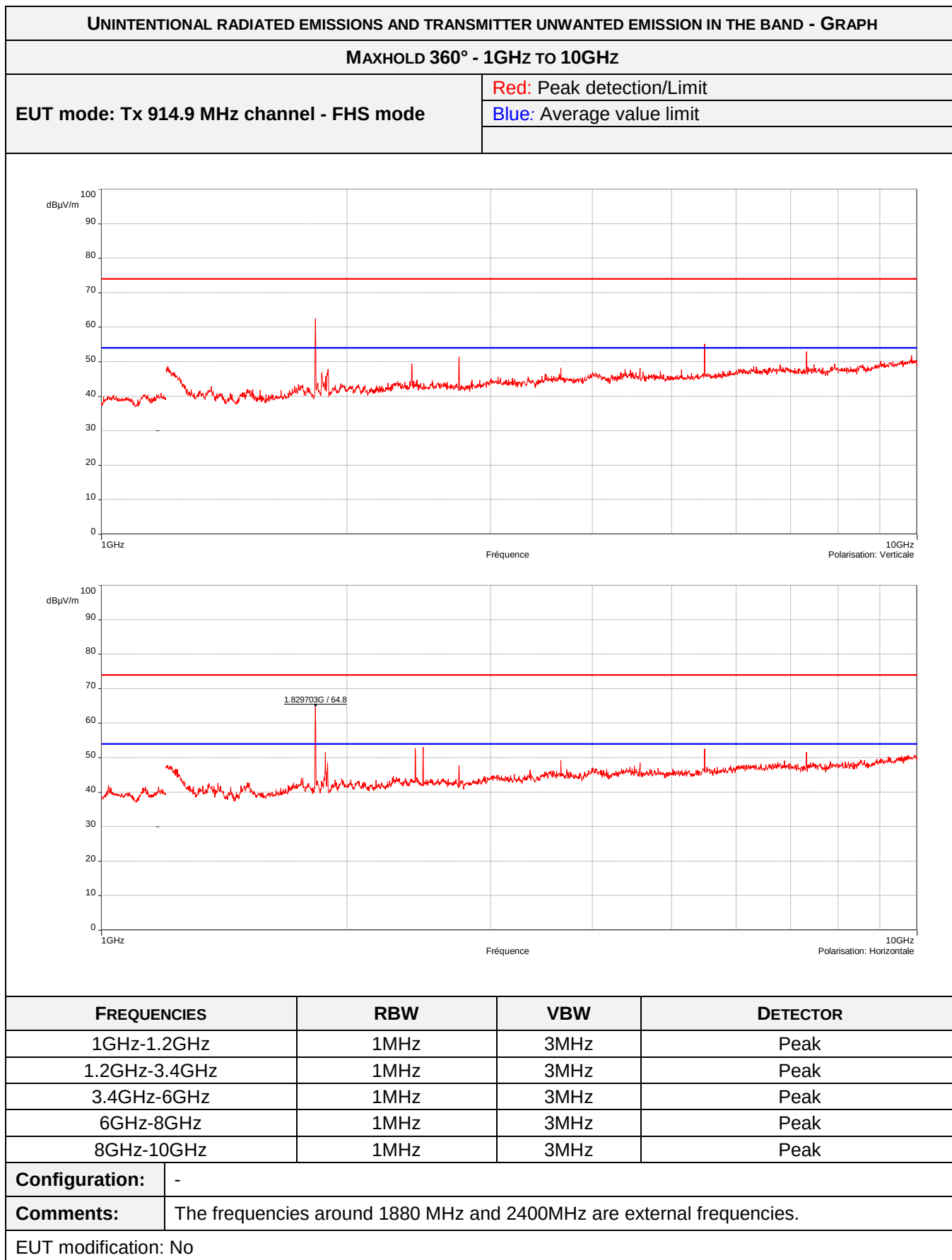


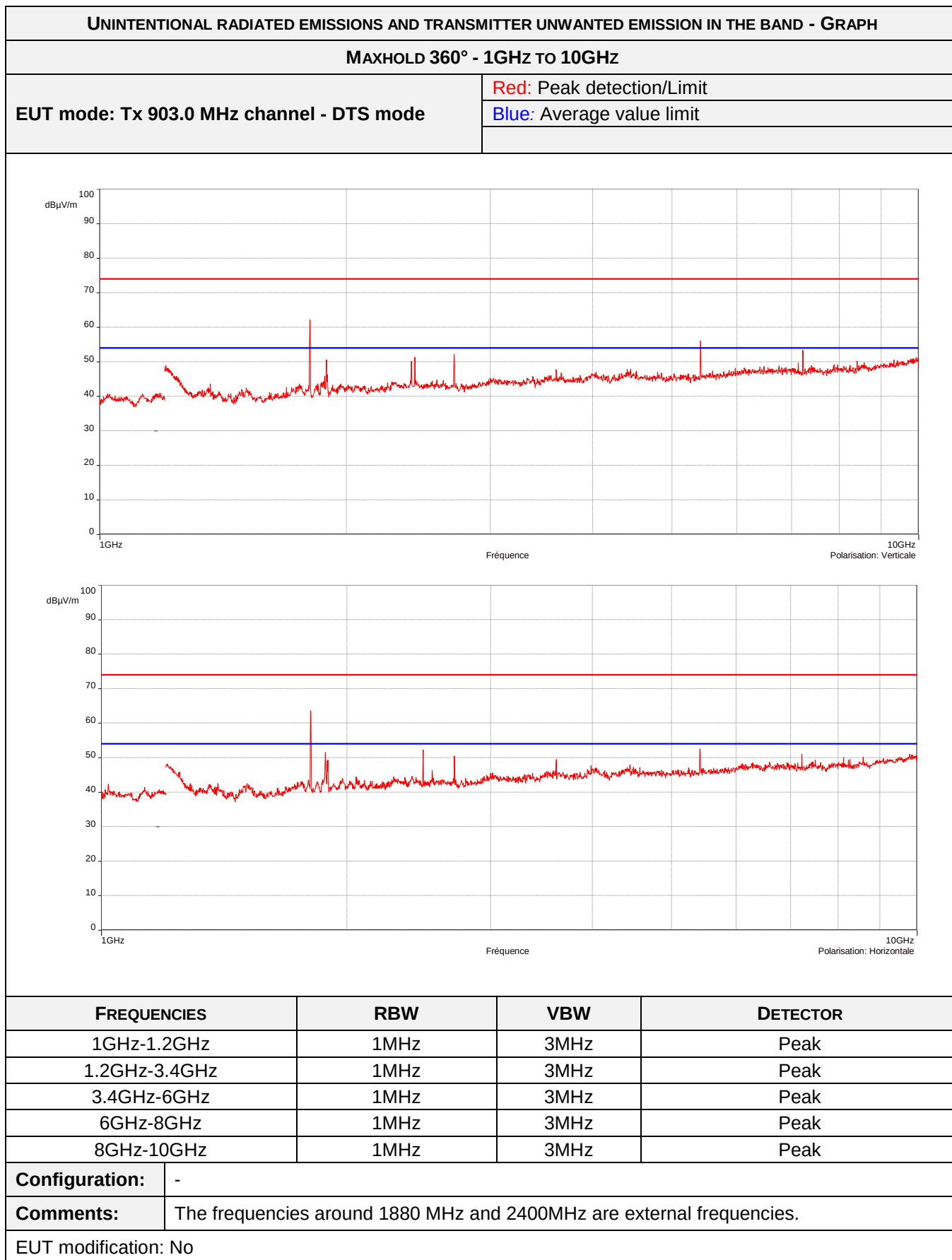


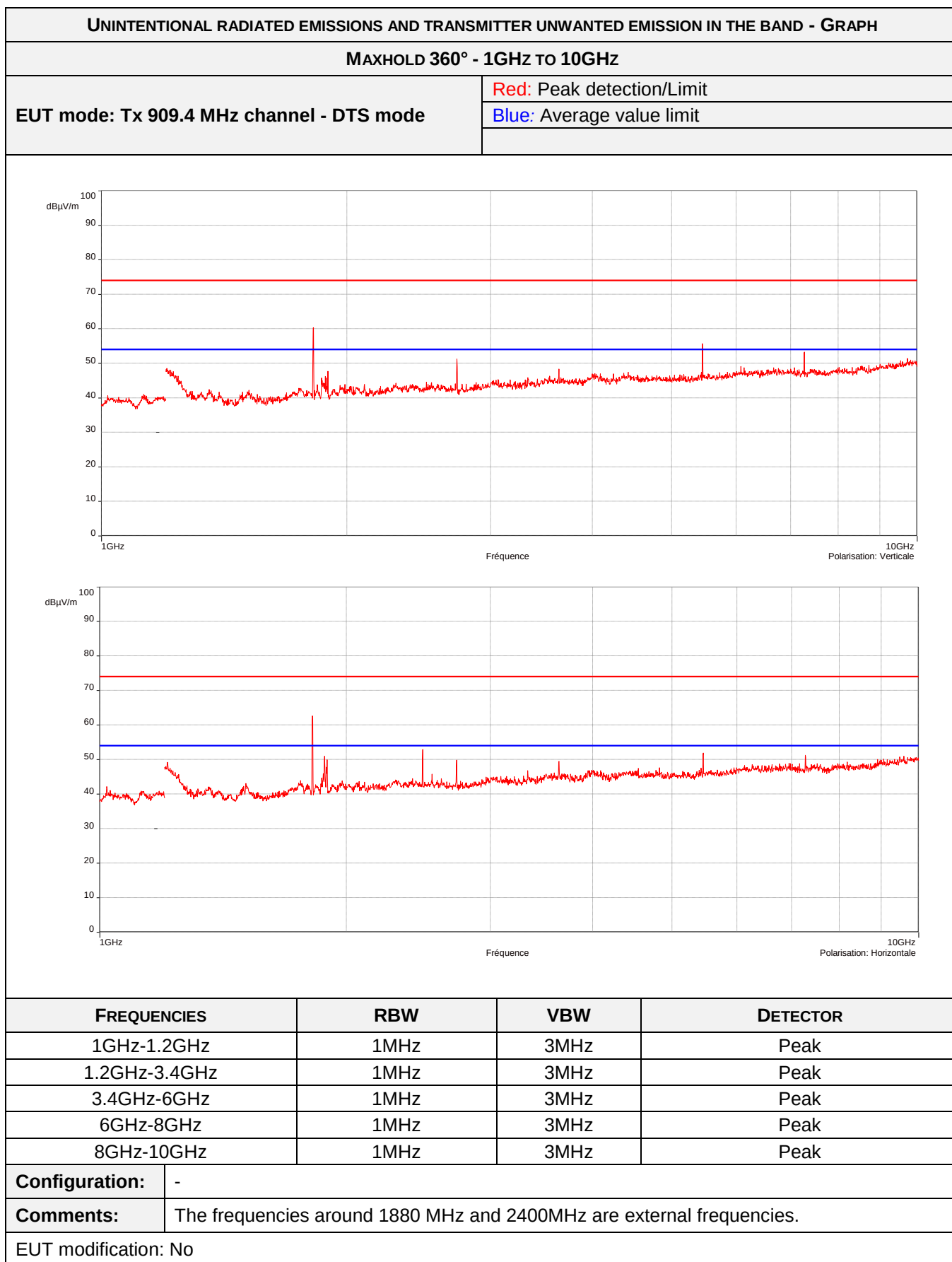


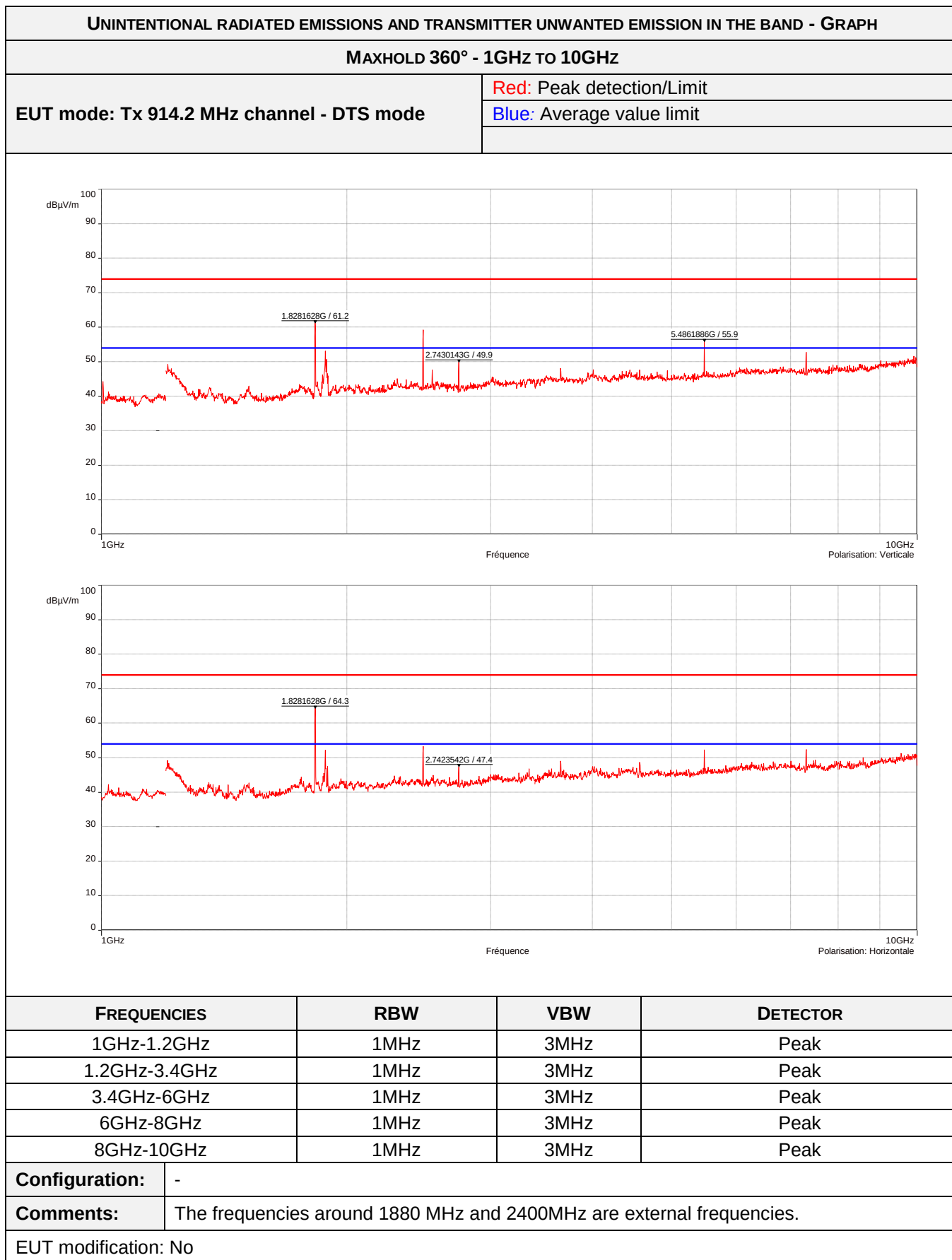












Nota : some frequencies are not necessarily recorded in the table because they have more than 10 dB with the margin. This is the case for frequencies that are not part of the restrictive bands of §15.205 of FCC 47 CFR PART 15 and therefore, which are compared to the limit of 74dBµV/m.

For FHS mode

Channel 902.3 MHz

Frequency (MHz)	Height (cm)	Polarization (H or V)	Azimuth (°)	Electro-magnetic field (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2706.85	120	V	325	45.9	54.0	8.1
3609.24	100	V	200	40.5	54.0	13.5
4511.61	150	V	80	39.6	54.0	14.4
5414.18	120	V	25	49.4	54.0	4.6
2706.90	100	H	200	45.6	54.0	8.4
3609.07	200	H	50	42.2	54.0	11.8
4511.70	140	H	320	40.4	54.0	13.6
5414.76	180	H	330	48.3	54.0	5.7
8120.68	170	H	190	39.8	54.0	14.2

H : Horizontal – V : Vertical

Channel 908.7 MHz

Frequency (MHz)	Height (cm)	Polarization (H or V)	Azimuth (°)	Electro-magnetic field (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2726.09	110	V	320	45.4	54.0	8.6
3634.80	150	V	170	37.2	54.0	16.8
4543.35	120	V	320	37.5	54.0	16.5
5452.09	130	V	20	50.1	54.0	3.9
7269.74	100	V	20	46.7	54.0	7.3
2726.00	125	H	160	43.2	54.0	10.8
3634.90	120	H	330	41.1	54.0	12.9
4543.35	130	H	130	38.1	54.0	15.9
5452.22	170	H	340	46.0	54.0	8.0
7269.74	120	H	40	44.1	54.0	9.9
8178.63	170	H	360	40.9	54.0	13.1

H : Horizontal – V : Vertical

Channel 914.9 MHz

Frequency (MHz)	Height (cm)	Polarization (H or V)	Azimuth (°)	Electro-magnetic field (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2744.75	150	V	20	43.3	54.0	10.7
3659.47	190	V	240	37.8	54.0	16.2
4574.60	200	V	70	38.8	54.0	15.2
7319.28	170	V	360	47.2	54.0	6.8
2744.66	100	H	230	45.0	54.0	9.0
3659.47	190	H	240	37.8	54.0	16.2
4574.46	140	H	340	39.0	54.0	15.0
7319.28	100	H	40	48.2	54.0	5.8
8234.20	170	H	360	41.8	54.0	12.2

H : Horizontal – V : Vertical

For DTS mode

Channel 903.0 MHz

Frequency (MHz)	Height (cm)	Polarization (H or V)	Azimuth (°)	Electro-magnetic field (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2709.02	110	V	30	39.1	54.0	14.9
3612.28	140	V	20	32.9	54.0	21.1
4515.29	100	V	320	33.4	54.0	20.6
5417.98	140	V	20	42.8	54.0	11.2
2709.02	100	H	230	40.3	54.0	13.7
3612.28	120	H	330	36.5	54.0	17.5
4515.38	100	H	40	32.6	54.0	21.4
5417.98	120	H	340	39.4	54.0	14.6
8127.00	100	H	0	39.1	54.0	14.9

H : Horizontal – V : Vertical

Channel 909.4 MHz

Frequency (MHz)	Height (cm)	Polarization (H or V)	Azimuth (°)	Electro-magnetic field (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2728.20	110	V	320	41.4	54.0	12.6
3637.75	150	V	30	34.0	54.0	20.0
4546.98	160	V	80	35.2	54.0	18.8
4456.47	100	V	30	41.7	54.0	12.3
7275.17	100	V	0	39.0	54.0	15.0
2728.20	100	H	230	41.6	54.0	12.4
3637.77	150	H	30	36.7	54.0	17.3
4546.98	130	H	330	34.3	54.0	19.7
5456.47	140	H	330	40.2	54.0	13.8
7275.17	100	H	70	38.3	54.0	15.7

H : Horizontal – V : Vertical

Channel 914.2 MHz

Frequency (MHz)	Height (cm)	Polarization (H or V)	Azimuth (°)	Electro-magnetic field (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2742.61	110	V	320	39.9	54.0	14.1
3656.83	170	V	200	33.0	54.0	21.0
4570.99	100	V	360	33.1	54.0	20.9
7313.85	100	V	30	40.4	54.0	13.6
2742.61	200	H	80	43.1	54.0	10.9
3656.83	100	H	30	35.6	54.0	18.4
4570.99	100	H	120	34.2	54.0	19.8
7313.85	100	H	310	38.8	54.0	15.2
8227.20	100	H	20	38.2	54.0	15.8

H : Horizontal – V : Vertical

End of test report